

## GENERAL NOTES

### PILES AND PILE DRIVING

#### 1. DESIGN DATA

a. PILING DESIGN LOADS, MATERIAL SPECIFICATIONS AND EMBEDMENT REQUIREMENTS ARE AS NOTED ON THE DESIGN DRAWINGS AND ARE BASED ON PAST PROJECTS AT SITE.

#### 2. SUBSURFACE CONDITIONS

a. PILE TIP ELEVATIONS SHOWN IN THE DRAWINGS FOR PILES ARE ESTIMATES ONLY. ACTUAL PILE TIP ELEVATIONS MAY VARY FROM THIS ESTIMATED TIP ELEVATION DUE TO VARYING SOIL CONDITIONS. IF THE LOAD BEARING CAPACITY OF THE PILE HAS NOT BEEN REACHED AT THE INDICATED TIP ELEVATION, DRIVING SHALL CONTINUE UNTIL THE LOAD BEARING CAPACITY IS REACHED, AS DIRECTED BY THE ENGINEER.

#### 3. MATERIALS

a. ALL STEEL PIPE PILING SHALL CONFORM TO ASTM A252 GR. 3. ( $f_y = 45$  KSI MIN).

b. ALL STEEL PILING SHALL BE UNPAINTED UNLESS OTHERWISE NOTED.

#### 4. EXECUTION

a. ALL DRIVING EQUIPMENT SHALL BE SUBJECT TO APPROVAL BY THE OWNER'S REPRESENTATIVE. BEARING PILES SHALL BE DRIVEN ONTO BASALT ROCK LAYER WITH SUITABLE IMPACT HAMMER. FENDER PILES MAYBE DRIVEN WITH EITHER IMPACT OR VIBRATORY HAMMER.

b. PILE SPlicing, IF REQUIRED, SHALL BE A FULL PENETRATION BUTT WELD WITH MIN. 1/4" BACKING RING PER A.W.S. D1.1. ALL WELDERS SHALL BE QUALIFIED FOR THE WORK, AS PRESCRIBED IN AWS D1.1 AND COPIES OF THEIR CERTIFICATION SHALL BE SUBMITTED TO OWNER'S REPRESENTATIVE.

c. PILE CUT-OFFS ARE THE PROPERTY OF THE CONTRACTOR.

#### 5. INSPECTION

a. PILING SHALL BE INSPECTED BY OWNER'S REPRESENTATIVE TO VERIFY CAPACITY/EMBEDMENT.

#### 6. SUBMITTALS

a. SUBMIT DESCRIPTIONS OF PILE DRIVING EQUIPMENT FOR APPROVAL PRIOR TO COMMENCEMENT OF PILE INSTALLATIONS. INCLUDE DETAILS OF THE PILE HAMMER, POWER PLANT, LEADS, CUSHION MATERIAL AND HELMET.

### STRUCTURAL STEEL

1. DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE "MANUAL OF STEEL CONSTRUCTION" OF AMERICAN INSTITUTE OF STEEL CONSTRUCTION, NINTH EDITION, UNLESS OTHERWISE MODIFIED ON THE DRAWING OR IN THE SPECIFICATIONS.

2. ERECTOR SHALL PROVIDE ALL TEMPORARY SHORING AND BRACING NEEDED FOR STABILITY UNTIL THE STRUCTURE IS COMPLETED.

3. MATERIAL SHALL MEET THE REQUIREMENTS OF THE FOLLOWING SPECIFICATIONS, UNLESS NOTED OTHERWISE:

STRUCTURAL STEEL -- ASTM A36  
WELDED STEEL -- AWS D1.1  
ELECTRODES -- E70XX  
HIGH STRENGTH BOLTS -- ASTM A325 -- 3/4"

GALV.

BOLTS, NUTS & WASHERS  
UNLESS OTHERWISE NOTED

4. ALL SHOP CONNECTIONS SHALL BE WELDED OR MADE WITH HIGH STRENGTH BOLTS U.O.N., AND ALL FIELD CONNECTIONS SHALL BE MADE WITH HIGH STRENGTH BOLTS U.O.N.

5. GUSSET PLATES SHALL BE 3/8" MINIMUM THICKNESS. WELDING TO FULLY DEVELOP GUSSET PLATES IS REQUIRED.

6. FRAMED BEAM CONNECTIONS, SHOP AND FIELD, SHALL BE DESIGNED USING TABLE II, III OR IV OF THE AISC MANUAL UNLESS NOTED.

A. 3/8" MINIMUM THICKNESS CONNECTING ANGLES.

B. FOR BOLTED CONNECTIONS THE MINIMUM BOLTS PER VERTICAL ROW, UNLESS MORE BOLTS ARE REQUIRED FOR LOADING SHOWN ON DRAWINGS, SHALL BE AS FOLLOWS:

C8, C10, W8, W10.....2  
C12, W12, W14.....3  
C15, W16.....4  
C8, W18.....5

NOTE: CHANNEL CONNECTIONS MAY BE ONE SIDED.

7. ALL HIGH STRENGTH BOLTED CONNECTIONS SHALL BE BEARING TYPE WITH THREADS EXCLUDED IN THE SHEAR PLANE UNLESS OTHERWISE NOTED.

8. ALL HORIZONTAL BRACING CONNECTIONS SHALL HAVE TWO BOLTS MIN. OR BE WELDED TO EQUIVALENT STRENGTH UNLESS OTHERWISE NOTED.

9. ALL FABRICATED STEEL ITEMS SHALL BE UNPAINTED UNLESS OTHERWISE NOTED.

10. FABRICATOR TO SUBMIT CHECKED SHOP DRAWINGS FOR REVIEW BY ENGINEER PRIOR TO FABRICATION. ENGINEER SHALL SUBMIT SIGNED AND REVIEWED COPY TO CITY OF PORTLAND PRIOR TO PLACING.

### TIMBER

1. ALL NEW TIMBER DECKING, BULLRAILS, CROSS BRACING, BEAMS, ETC. SHALL BE D.F. #1.

2. ALL TIMBER MEMBERS SHALL BE PRESSURE TREATED WITH A MINIMUM NET RETENTION OF 0.60 lb/cf WITH A.C.Z.A. PER AWPA C-2.

3. ALL FIELD DRILLED HOLES, CUTS, ETC. IN TIMBER PILES SHALL BE TOUCHED UP WITH A.C.Z.A. PER AWPA M-4.

4. ALL FASTENERS SHALL BE GALVANIZED UNLESS NOTED.

### SPECIAL INSPECTIONS

THE FOLLOWING SPECIAL INSPECTIONS ARE REQUIRED FOR THIS PROJECT IN ACCORDANCE WITH SECTION 1701 OF THE UNIFORM BUILDING CODE:

#### 1. PILE DRIVING

VERIFY ALL PILING IS INSTALLED PER DESIGN DRAWINGS/SPECS INCLUDING:

a. VERIFY THAT ADEQUATE LOAD BEARING IS REACHED IN COMPRESSION PILES AS DIRECTED BY THE ENGINEER IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND TECHNICAL SPECIFICATIONS.

b. VERIFY THAT THE PROPER EMBEDMENT IS OBTAINED.

#### 2. STRUCTURAL WELDING

VERIFY ALL STRUCTURAL WELDING IS PERFORMED PER DESIGN DRAWINGS/SPECS.

c. ALL WELDERS SHALL BE QUALIFIED FOR THE WORK, AS PRESCRIBED IN A.W.S. D1.1 AND COPIES OF THEIR CERTIFICATION SHALL BE PROVIDED TO THE SPECIAL INSPECTOR.

#### 3. ADHESIVE/EXPANSION ANCHORS

a. VERIFY INSTALLATION COMPLIANCE WITH MANUFACTURER'S SPECIFICATIONS AND I.C.B.O. REPORT.

THE OWNER SHALL RETAIN A CERTIFIED SPECIAL INSPECTOR TO PERFORM THE INSPECTIONS OUTLINED ABOVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE INSPECTOR TWO DAYS PRIOR TO ALL REQUIRED INSPECTIONS.

### DEMOLITION

1. ALL DEMOLISHED MATERIAL/ WASTE SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE LOCAL/STATE/FEDERAL REGULATIONS.

2. ALL EXISTING UTILITIES AND PRODUCT PIPING SHALL REMAIN IN OPERATION DURING CONSTRUCTION, AND CONTRACTOR SHALL PROVIDE ANY TEMPORARY SUPPORTS AS NEEDED, UNTIL NEW SUPPORTS INSTALLED.

3. ANY DAMAGE TO EXISTING FACILITY, UTILITIES & PRODUCT PIPING, ETC. RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED PER OWNER'S SPECIFICATIONS AT THE EXPENSE OF THE CONTRACTOR.

### DRAWING LIST

DWG. NO.	TITLE
WP001	DRAWING LIST & GENERAL NOTES
WP002	VICINITY MAP
WP003	USGS TOPOGRAPHIC MAP
WP004	TAX LOT MAP
WP005	AERIAL MAP
WP006	DOCK PLAN
WP007	DOCK PILE LAYOUT -- BENT 1--32
WP008	DOCK PILE LAYOUT -- BENT 32--79
WP009	TYPICAL DOCK CROSS SECTION A
WP010	TYPICAL DOCK CROSS SECTION B

REFERENCE NUMBER:  
LOCATION: 5800 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.568045 N  
LONGITUDE: 122.737944 W  
WILLAMETTE RIVER MILE: 7.5  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 1 OF 10

PRELIMINARY  
NOT FOR CONSTRUCTION



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #

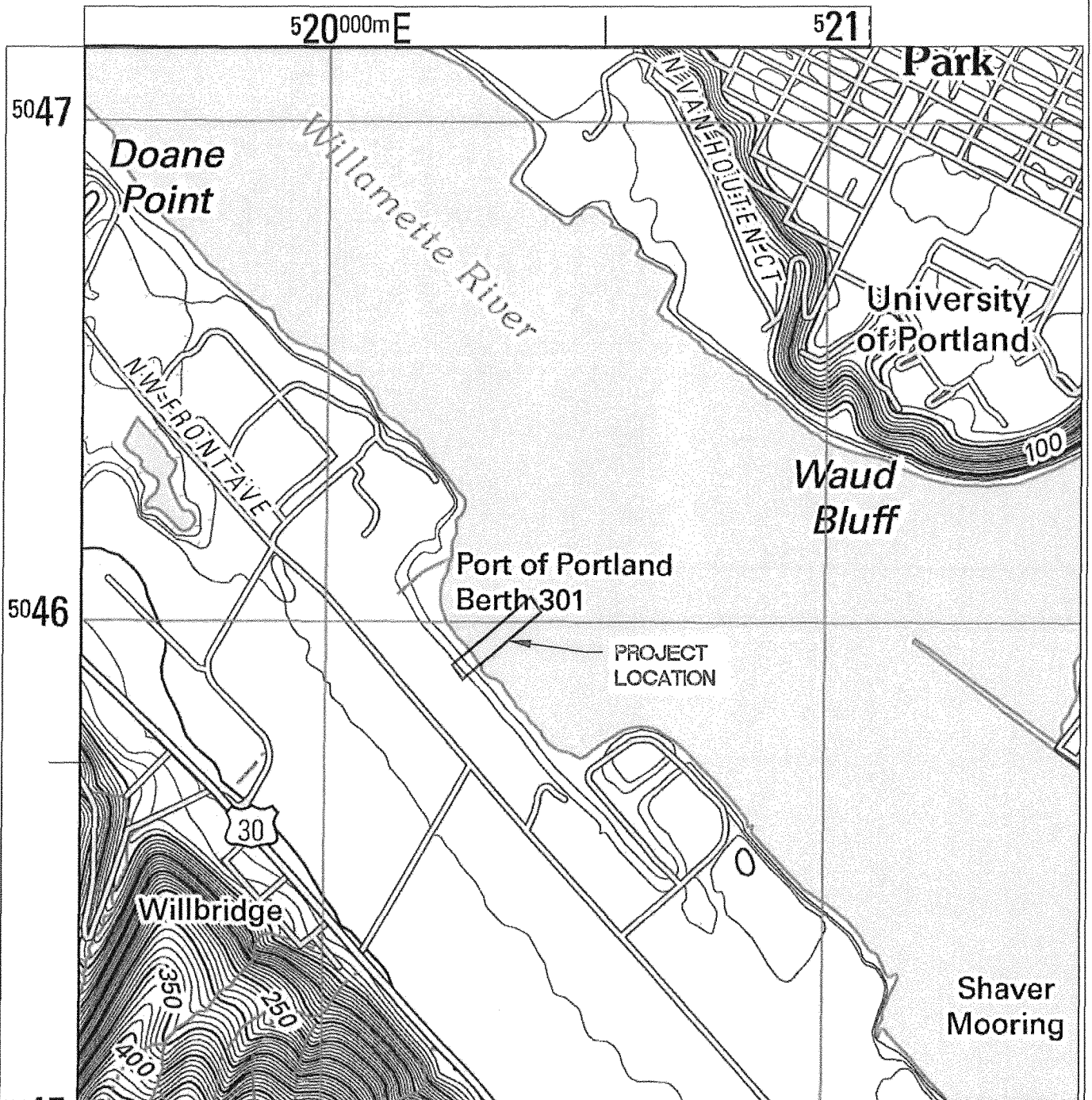
0409

WILLBRIDGE KINER MORGAN OR

WILLBRIDGE DOCK UPGRADE  
PORTLAND, OREGON  
DRAWING LIST & GENERAL NOTES

CHKD. DLM	DRWN. TRF	PROJECT NO. 0409	
APPR. MJS	DATE 07/01/14	DWG. NO. WP001	REV. A
SCALE AS NOTED			





Produced by the United States Geological Survey  
 North American Datum of 1983 (NAD83)  
 World Geodetic System of 1984 (WGS84). Projection and  
 1 000-meter grid: Universal Transverse Mercator, Zone 10T  
 10 000-foot ticks: Oregon Coordinate System of 1983 (north  
 zone), Washington Coordinate System of 1983 (south zone)

SCALE 1:24 000




PORTLAND QUADRANGLE  
 OREGON-WASHINGTON  
 7.5-MINUTE SERIES



REFERENCE NUMBER:  
 LOCATION: 5800 NW ST. HELENS RD.  
 PORTLAND, OR  
 PROPOSED PROJECT: DOCK UPGRADE  
 LATITUDE: 45.568045 N  
 LONGITUDE: 122.737944 W  
 WILLAMETTE RIVER MILE: 7.5  
 DATUM: COLUMBIA RIVER DATUM  
 DATE 07/01/2014 EXHIBIT 3 OF 10

PRELIMINARY  
 NOT FOR CONSTRUCTION

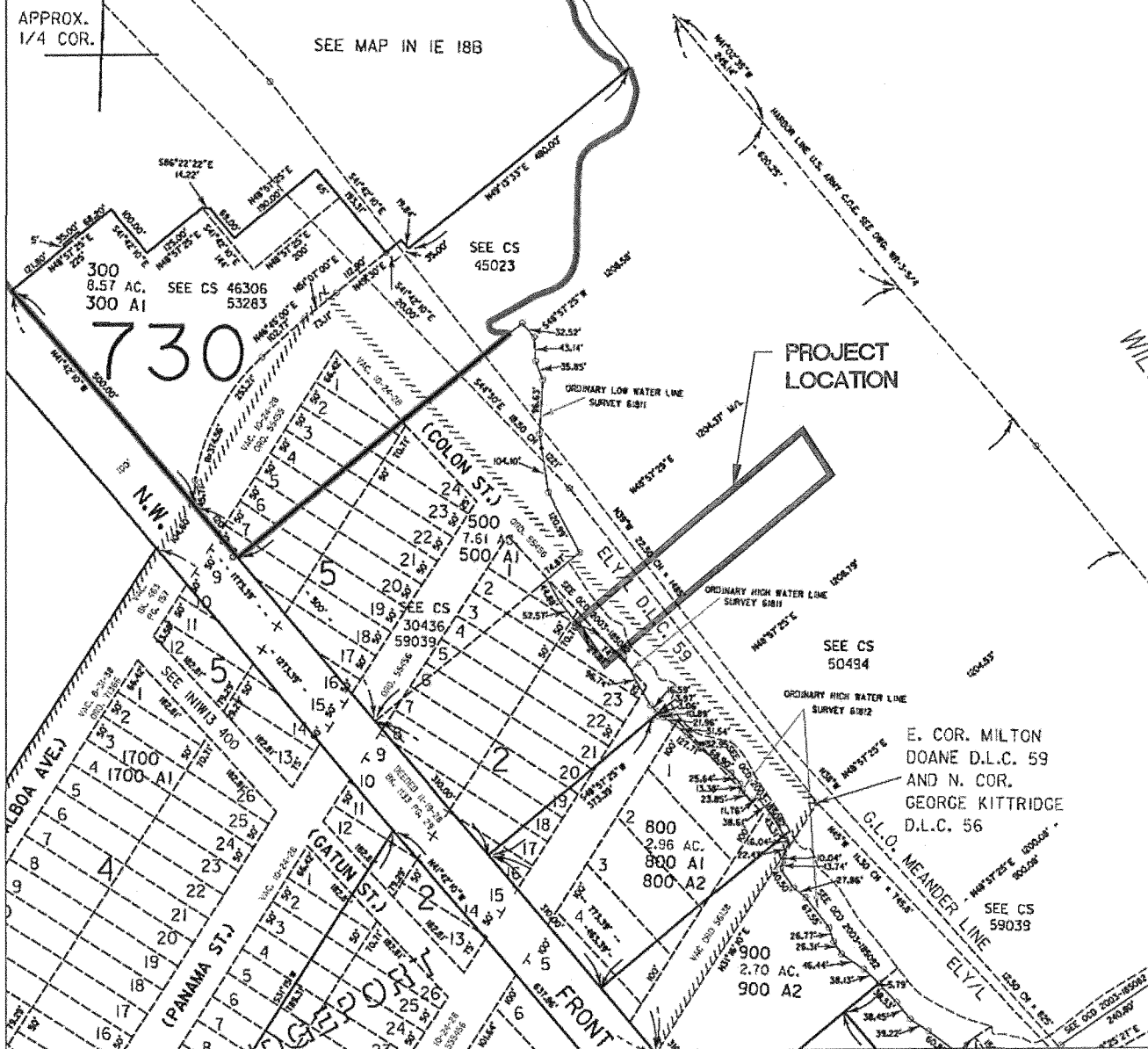
 <b>NORWEST ENGINEERING</b> CONSULTING ENGINEERS 503-254-0110		N.E. # 0409
4110 NE 122ND AVE #207 PORTLAND, OREGON		
KINDER MORGAN OR		
WILLBRIDGE DOCK UPGRADE PORTLAND, OREGON USGS TOPOGRAPHIC MAP		
CHKD. DLM	DRWN. TRF	PROJECT NO. 0409
APPR. MJS	DATE 07/01/14	DWG. NO. WP003
SCALE AS NOTED		REV. A



WAS PREPARED FOR  
ENT PURPOSE ONLY

SW1/4 SEC. 18 T.1N. R.1E. W.M.  
MULTNOMAH COUNTY

1" = 200'



300' 150' 0' 300' 600'  
1"=300'

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WILLAMETTE RIVER MILE: 7.5  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 4 OF 10

PRELIMINARY  
NOT FOR CONSTRUCTION



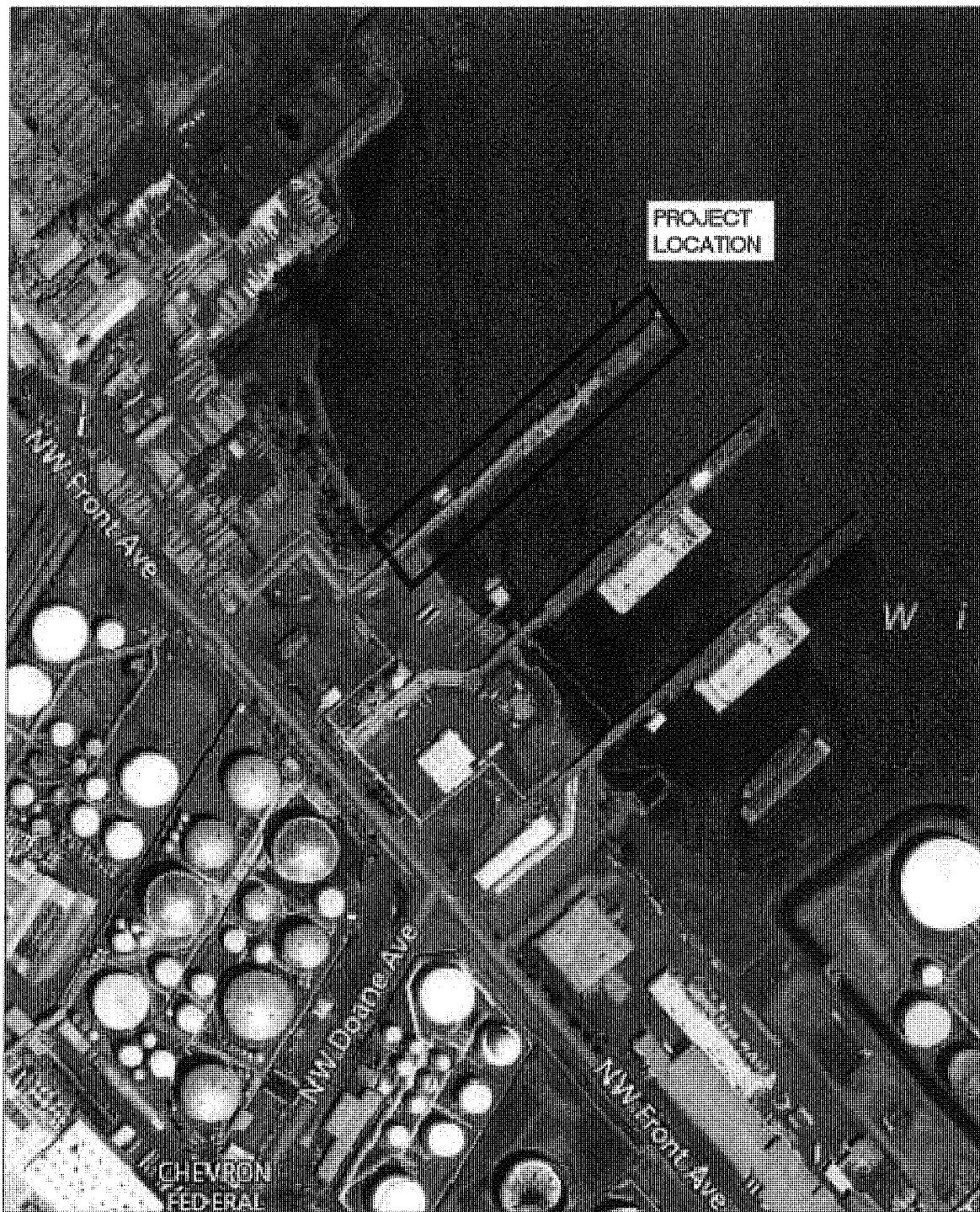
**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #  
0409

WILLBRIDGE		KINDER MORGAN		OR	
WILLBRIDGE DOCK UPGRADE PORTLAND, OREGON TAX LOT MAP					
CHKD. DLM	DRWN. TRF	PROJECT NO. 0409			
APPR. MJS	DATE 07/01/14	DWG. NO. WP004		REV. A	
SCALE AS NOTED					



REFERENCE NUMBER:  
LOCATION: 5800 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.568045 N  
LONGITUDE: 122.737944 W  
WILLAMETTE RIVER MILE: 7.5  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 5 OF 10

PRELIMINARY  
NOT FOR CONSTRUCTION



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #  
0409

KINDER MORGAN  
WILLBRIDGE OR

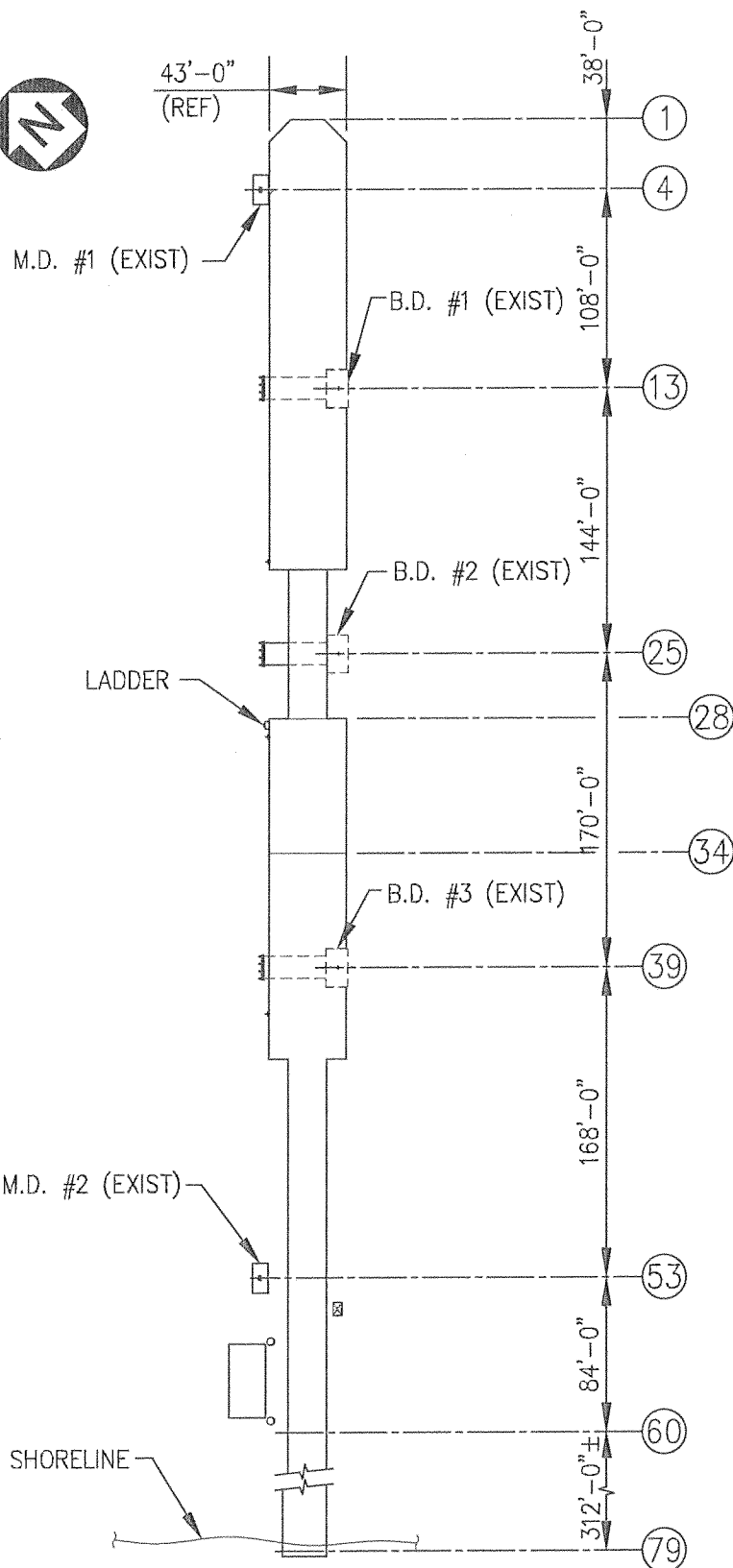
WILLBRIDGE DOCK UPGRADE  
PORTLAND, OREGON  
AERIAL MAP

CHKD. DLM  
APPR. MJS  
SCALE AS NOTED

DRWN. TRF  
DATE 07/01/14

PROJECT NO. 0409  
DWG. NO.  
WP005

REV.  
A



REPLACE 100 PILES THRU-OUT  
DOCK (SEE DWG 04 & 05 FOR  
ENLARGED VIEW)

### LEGEND

- (13) - EXIST SUPPORT BENT  
B.D. - BREASTING DOLPHIN  
M.D. - MOORING DOLPHIN



REFERENCE NUMBER:  
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PORTLAND, OR  
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LATITUDE: 45.568045 N  
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WILLAMETTE RIVER MILE: 7.5  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 6 OF 10



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #

0409

WILLBRIDGE

KINDER MORGAN

OR

WILLBRIDGE DOCK UPGRADE  
PORTLAND, OREGON  
DOCK PLAN

CHKD. DLM

DRWN. TRF

DATE 07/01/14

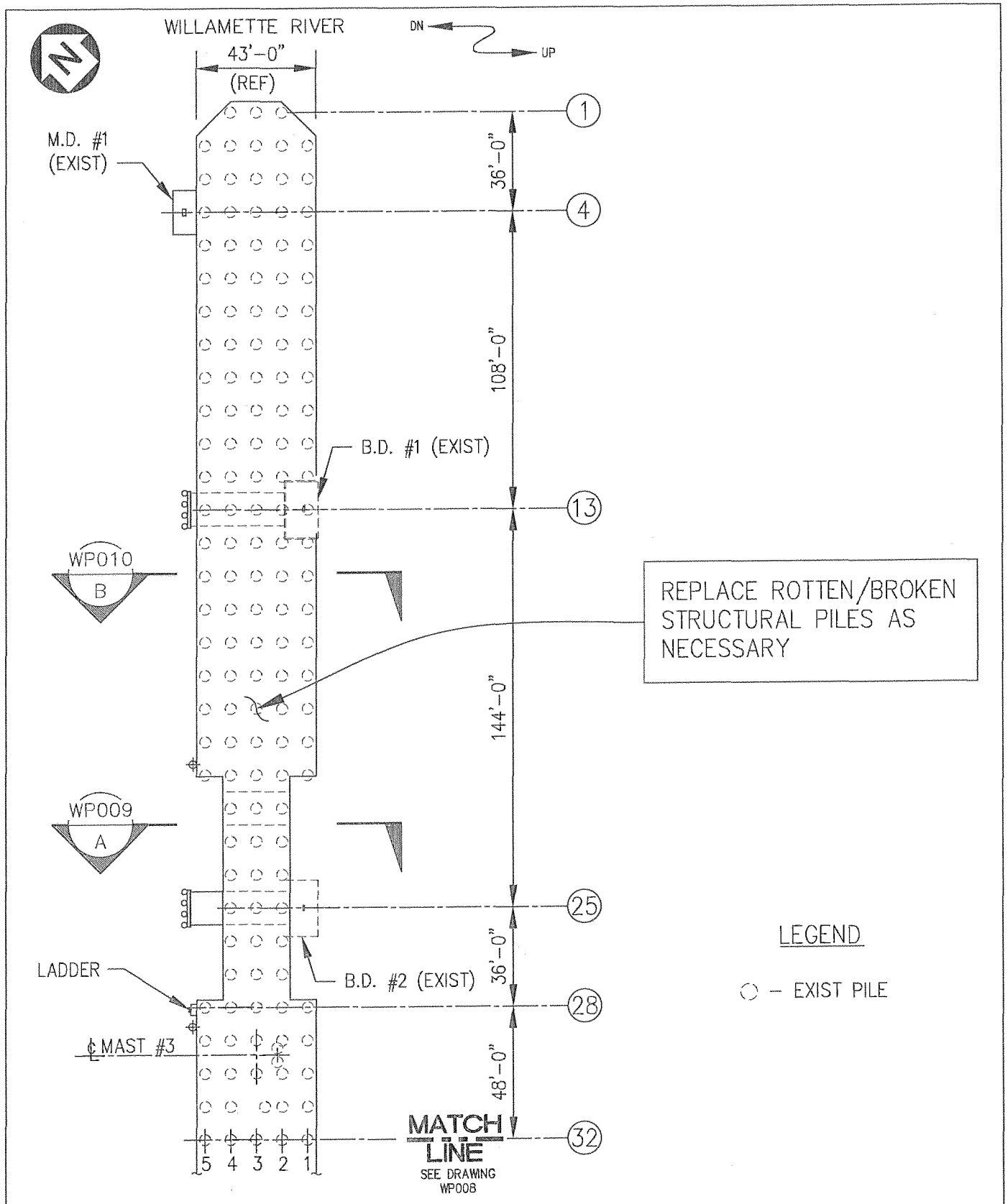
PROJECT NO. 0409

APPR. MJS  
SCALE AS NOTED

DWG. NO.  
WP006


REV.  
A

PRELIMINARY  
NOT FOR CONSTRUCTION

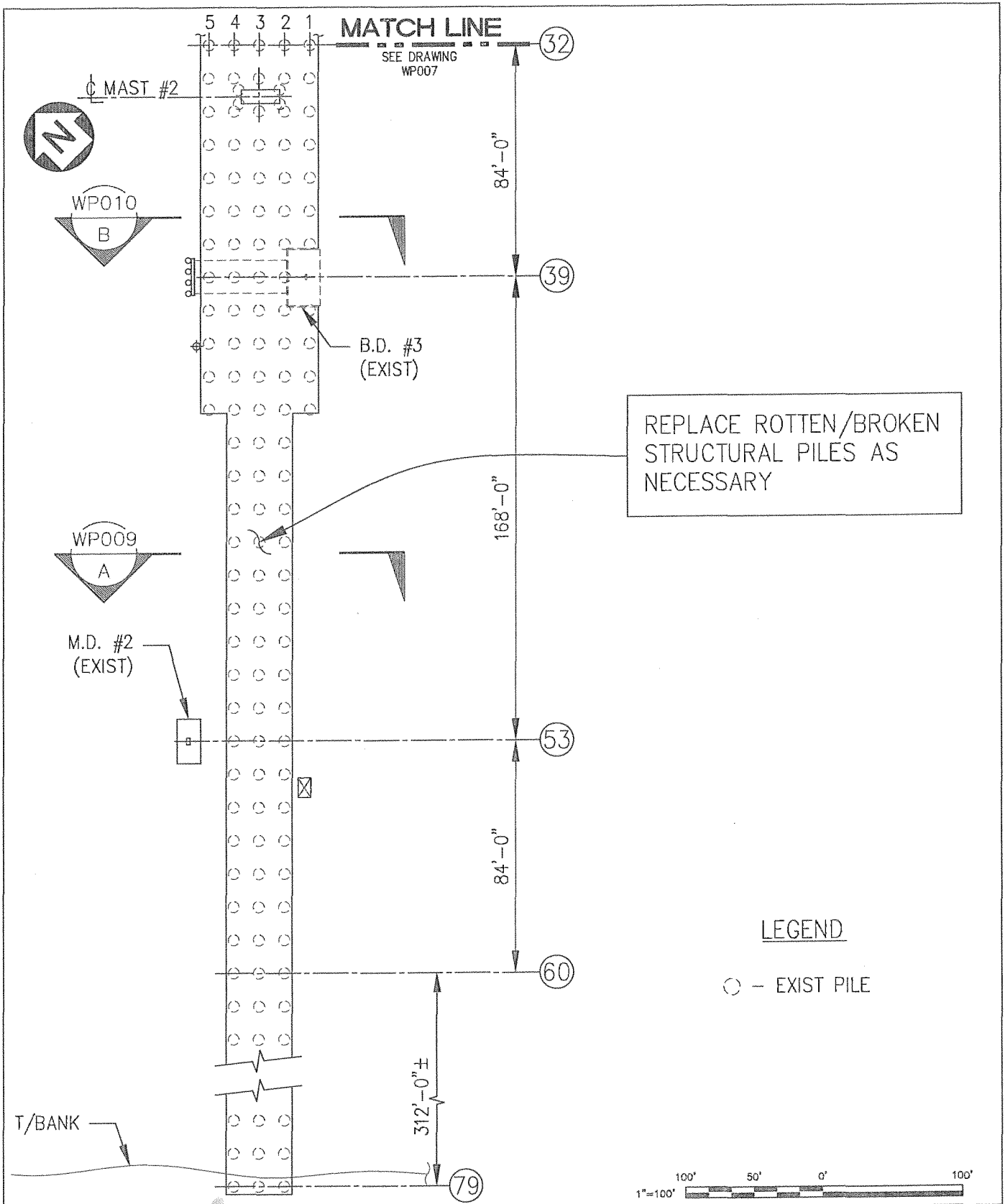


REFERENCE NUMBER:  
 LOCATION: 5800 NW ST. HELENS RD.  
 PORTLAND, OR  
 PROPOSED PROJECT: DOCK UPGRADE  
 LATITUDE: 45.568045 N  
 LONGITUDE: 122.737944 W  
 WILLAMETTE RIVER MILE: 7.5  
 DATUM: COLUMBIA RIVER DATUM  
 DATE 07/01/2014 EXHIBIT 7 OF 10

PRELIMINARY  
 NOT FOR CONSTRUCTION

	<b>NORWEST ENGINEERING</b>		N.E. #
	CONSULTING ENGINEERS 503-254-0110	4110 NE 122ND AVE #207 PORTLAND, OREGON	0409
KINDER MORGAN			OR
WILLBRIDGE DOCK UPGRADE PORTLAND, OREGON DOCK PLAN LAYOUT - BENT 1-32			
CHKD. DLM	DRWN. TRF	PROJECT NO.	0409
APPR. MJS	DATE 07/01/14	DWG. NO.	REV.
SCALE NTS		WP007	A



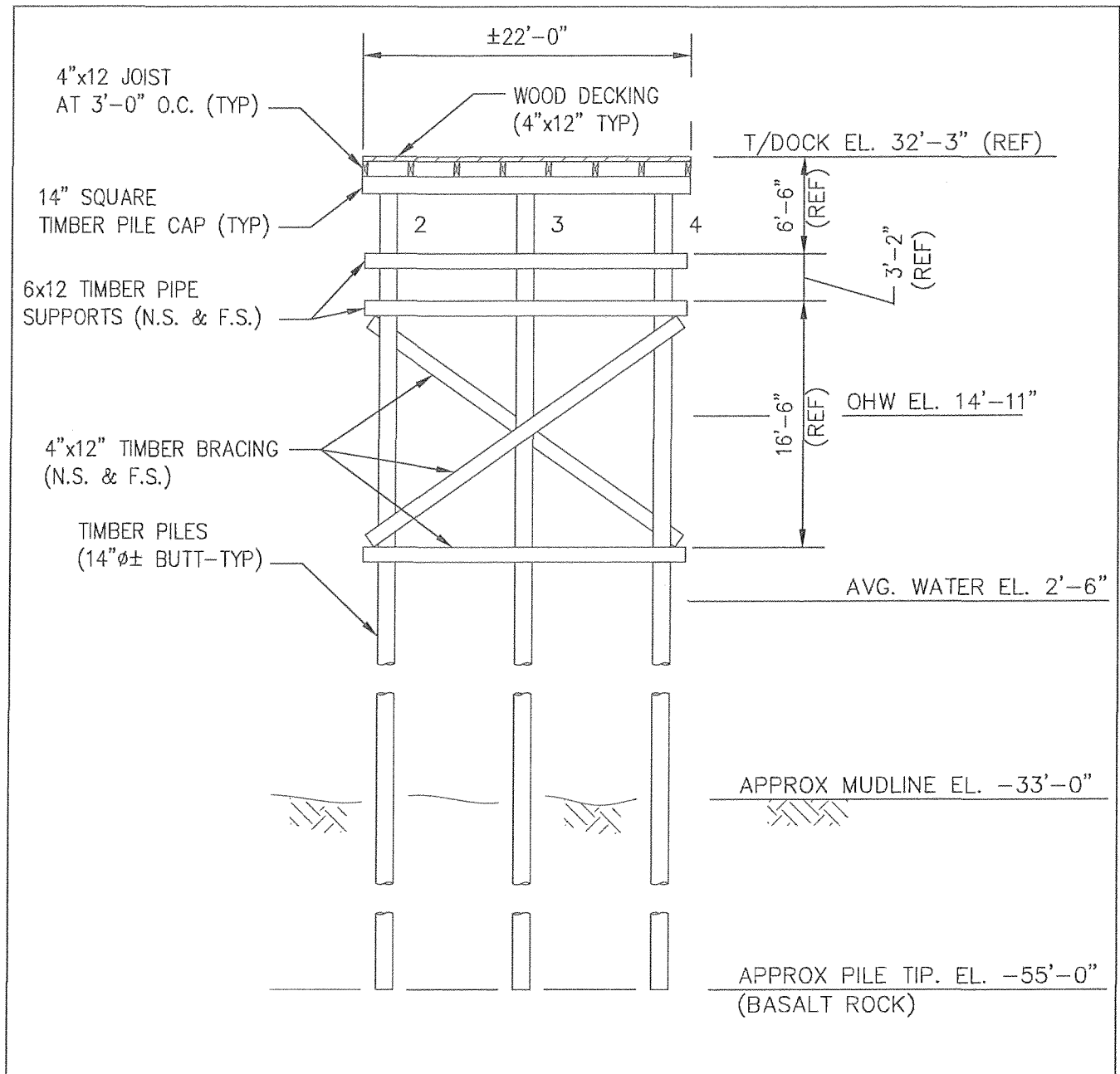


REFERENCE NUMBER:  
 LOCATION: 5800 NW ST. HELENS RD.  
 PORTLAND, OR  
 PROPOSED PROJECT: DOCK UPGRADE  
 LATITUDE: 45.568045 N  
 LONGITUDE: 122.737944 W  
 WILLAMETTE RIVER MILE: 7.5  
 DATUM: COLUMBIA RIVER DATUM  
 DATE 07/01/2014 EXHIBIT 8 OF 10

PRELIMINARY  
 NOT FOR CONSTRUCTION

<b>NORWEST ENGINEERING</b> CONSULTING ENGINEERS 503-254-0110		4110 NE 122ND AVE #207 PORTLAND, OREGON	N.E. # 0409
KINDER MORGAN			
WILLBRIDGE		OR	
WILLBRIDGE DOCK UPGRADE PORTLAND, OREGON DOCK PILE LAYOUT - BENT 32-79			
CHKD. DLM APPR. MJS SCALE NTS	DRWN. TRF DATE 07/01/14	PROJECT NO. 0409 DWG. NO. WP008	REV. A

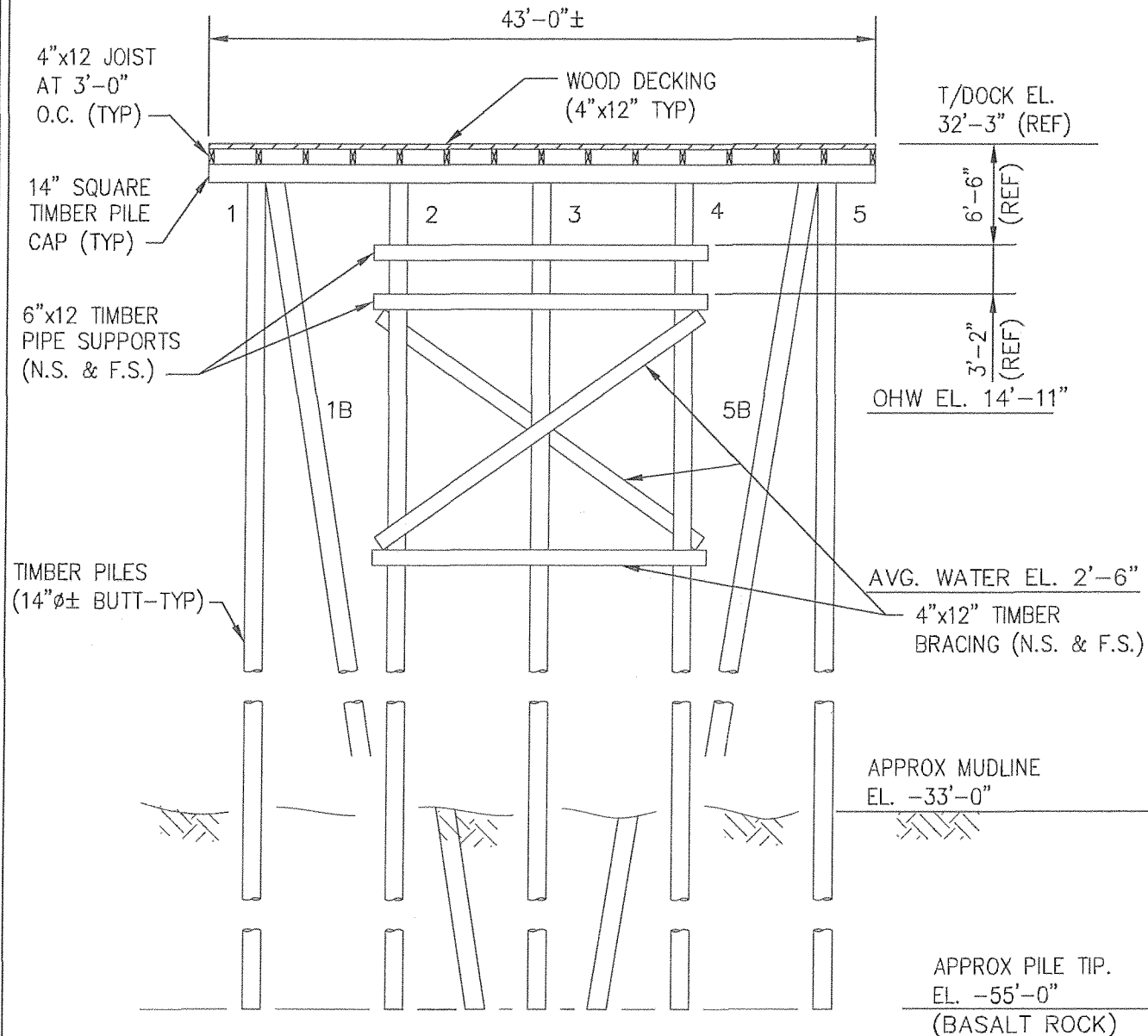




REFERENCE NUMBER:  
 LOCATION: 5800 NW ST. HELENS RD.  
 PORTLAND, OR  
 PROPOSED PROJECT: DOCK UPGRADE  
 LATITUDE: 45.568045 N  
 LONGITUDE: 122.737944 W  
 WILLAMETTE RIVER MILE: 7.5  
 DATUM: COLUMBIA RIVER DATUM  
 DATE 07/01/2014 EXHIBIT 9 OF 10

PRELIMINARY  
 NOT FOR CONSTRUCTION

<b>NORWEST ENGINEERING</b> CONSULTING ENGINEERS 503-254-0110		4110 NE 122ND AVE #207 PORTLAND, OREGON		N.E. #
				0409
KINDER MORGAN WILLBRIDGE OR				
WILLBRIDGE DOCK UPGRADE PORTLAND, OREGON TYPICAL DOCK CROSS SECTION "A"				
CHKD. DLM	DRWN. TRF	PROJECT NO. 0409		
APPR. MJS	DATE 07/01/14	DWG. NO.	REV.	
SCALE NTS		WP009	A	



REFERENCE NUMBER:  
 LOCATION: 5800 NW ST. HELENS RD.  
 PORTLAND, OR  
 PROPOSED PROJECT: DOCK UPGRADE  
 LATITUDE: 45.568045 N  
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 WILLAMETTE RIVER MILE: 7.5  
 DATUM: COLUMBIA RIVER DATUM  
 DATE 07/01/2014 EXHIBIT 10 OF 10

PRELIMINARY  
 NOT FOR CONSTRUCTION

<b>NORWEST ENGINEERING</b> CONSULTING ENGINEERS 503-254-0110		N.E. # 0409
KINDER MORGAN WILLBRIDGE OR		
WILLBRIDGE DOCK UPGRADE PORTLAND, OREGON TYPICAL DOCK CROSS SECTION B		
CHKD. DLM	DRWN. TRF	PROJECT NO. 0409
APPR. MJS	DATE 07/01/14	DWG. NO. WP010
SCALE NTS		REV. A

## GENERAL NOTES:

### BEARING PILES

24" DIAMETER X 0.50" WALL

- ALL PILES ARE TO BE FURNISHED IN 40' MINIMUM LENGTHS - LONGER FURNISHED LENGTHS ARE PREFERRED.
- ALL STANDARD MANUFACTURE METHODS ARE ACCEPTABLE (ERW, SEAMLESS, DSAW, AND SPIRAL)
- ASTM A 252 GRADE 3 (FY = 45,000 PSI) MODIFIED AS FOLLOWS:
  - THE CARBON EQUIVALENCY (CE) SHALL NOT EXCEED 0.45 AS DEFINED IN AWS D 1.1, SECTION X 15.1, AND THE SULFUR CONTENT SHALL NOT EXCEED 0.05%.
  - THE CIRCUMFERENCE OF THE STEEL SHELL ENDS SHALL NOT VARY MORE THAN PLUS OR MINUS 0.375 INCHES FROM THE SIZE SHOWN ON THE PLANS.
  - THE MAXIMUM ALLOWABLE EDGE ALIGNMENT FOR PIPE IS 0.1875 TIMES THE WALL THICKNESS OR 0.063 INCHES, WHICH EVER IS LESS.
  - STEEL PIPE STRAIGHTNESS SHALL CONFORM TO THE REQUIREMENTS OF API 5L, SECTION 7.6 "STRAIGHTNESS".
  - STEEL PIPE PILE WELDS SHALL BE COMPLETE PENETRATION WELDS AND SHALL CONFORM TO THE REQUIREMENTS OF AWS D1.1 OR API 5L AND THE AMENDMENTS LISTED HEREIN. STEEL PILES SHALL NOT BE JOINED BY WELDED LAP SPlicing. WELDS SHALL BE MADE BY EITHER AN AUTOMATIC FUSION WELD OR AN ELECTRIC RESISTANCE WELD PROCESS. INCOMPLETE PENETRATION WELDS AND DEFECTIVE WELDS OF STEEL PIPE PILES SHALL BE REPAIRED OR RESTORED TO ACHIEVE COMPLETE JOINT PENETRATION GROOVE WELDS.

### CONCRETE - CAST IN PLACE

- CONCRETE RELATED WORK ON THIS PROJECT SHALL CONFORM TO ALL REQUIREMENTS OF ACI 301, LATEST EDITION, STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE PUBLISHED BY THE AMERICAN CONCRETE INSTITUTE.
- REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60.
- REINFORCING STEEL LAP SPLICES NOT OTHERWISE INDICATED SHALL BE ACI STANDARD CLASS B IF SPLICED AT THE SAME LOCATION OR CLASS A IF SPLICES ARE STAGGERED BETWEEN ADJACENT BARS ONE LAP LENGTH MINIMUM.

#### LAP SPLICES:

CLASS A		CLASS B	
BAR SIZE	LAP (IN)	BAR SIZE	LAP (IN)
NO. 6	37	NO. 6	48

- TOTAL AIR CONTENT IS 5% (+1 -1½)
- $f'_c = 4,000$  PSI, CAST-IN-PLACE  
 $f'_c = 4,000$  PSI, NO AIR ENTRAINMENT, PILES
- FINISHES:
  - FORM, EXPOSED SIDES
  - BROOM FINISH, TOPS
- FILL CAP AND PILES WITH CONCRETE  
CAP = 32.74 C.Y.  
8 PILES = 58.16 C.Y.

### STRUCTURAL STEEL

- FABRICATION & ERECTION OF STRUCTURAL STEEL TO BE IN ACCORDANCE WITH THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS ANSI/AISC 360-05 AND AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES AISC 303-05.
- MATERIAL WILL MEET THE REQUIREMENTS OF THE FOLLOWING SPECIFICATIONS, UNLESS NOTED OTHERWISE (U.N.O.):  
PLATES, BARS AND OTHER SHAPES - ASTM A36
- ALL WELDING TO BE DONE IN ACCORDANCE WITH AWS D1.1. WELDING ELECTRODES TO BE E70XX.

### GENERAL CONSTRUCTION REQUIREMENTS

- PROVIDE BMP'S FOR IN WATER CONTAINMENT BOOM AROUND WHOLE WORK LOCATION/DOCK.
- PROVIDE BMP'S FOR CATCHING ANY STRAY PAINT CHIPS OR CONSTRUCTION DEBRIS THAT COULD BE KNOCKED LOOSE DURING DEMO ACTIVITIES.
- PROVIDE TEMPORARY SPILL CATCH FOR PIPES DURING REMOVAL.
- WRAP PIPES TO CONTAIN ANY LEAD DURING CONSTRUCTION ACTIVITIES, REMOVAL AND TRANSPORT.
- PROVIDE BMP'S FOR CONTAINMENT OF FIBERGLASS DURING DEMO OF CRANE SPILL PAN.

## DRAWING LIST

DWG. NO.	TITLE
P001	DRAWING LIST & GENERAL NOTES
P002	VICINITY MAP
P003	USGS TOPOGRAPHIC MAP
P004	TAX LOT MAP
P005	AERIAL MAP
P006	DOCK PLAN
P007	DOCK ELEVATION 1
P008	DOCK ELEVATION 2
P009	DOCK ELEVATION 3
P010	MOORING DOLPHIN SOUTH ELEVATION
P011	MOORING DOLPHIN WEST ELEVATION
P012	MOORING DOLPHIN PLAN & SECTION
P013	MOORING DOLPHIN RAIL PLAN & ELEVATION
P014	MOORING DOLPHIN RAIL SECTION & DETAILS

## REFERENCE NUMBER:

LOCATION: 11400 NW ST. HELENS RD.

PORTLAND, OR

PROPOSED PROJECT: DOCK UPGRADE

LATITUDE: 45.604298 N

LONGITUDE: 122.785911 W

WILLAMETTE RIVER MILE: 4.2

DATUM: COLUMBIA RIVER DATUM

DATE 07/01/2014

EXHIBIT 1 OF 14



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #

0409

KINDER MORGAN

LINNTON

OR

LINNTON DOCK UPGRADE  
PORTLAND, OREGON  
DRAWING LIST & GENERAL NOTES

CHKD. DLM

DRWN. TRF

PROJECT NO. 0409

APPR. MJS

DATE 07/01/14

DWG. NO.

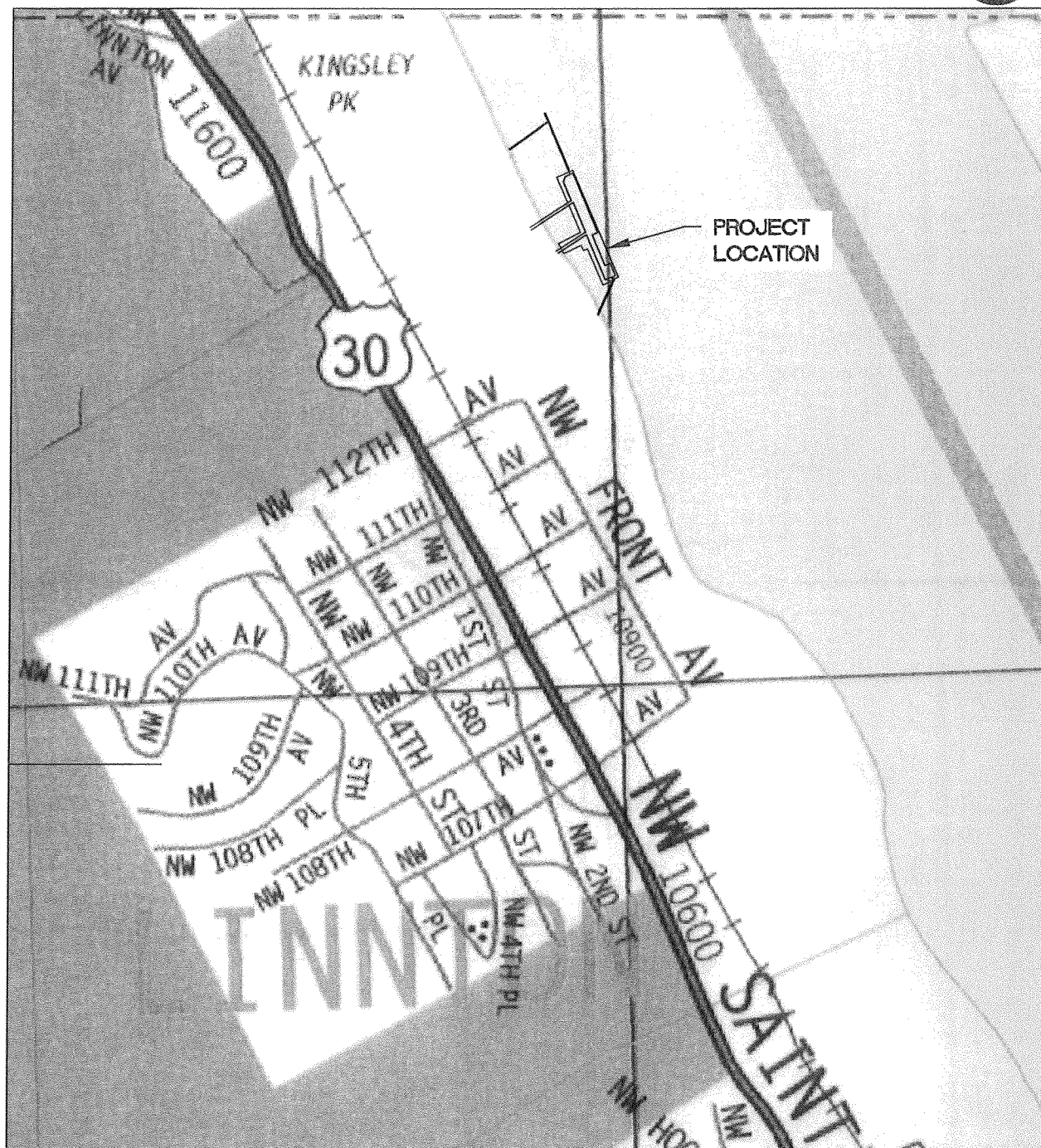
REV.

SCALE AS NOTED

P001

A

PRELIMINARY  
NOT FOR CONSTRUCTION

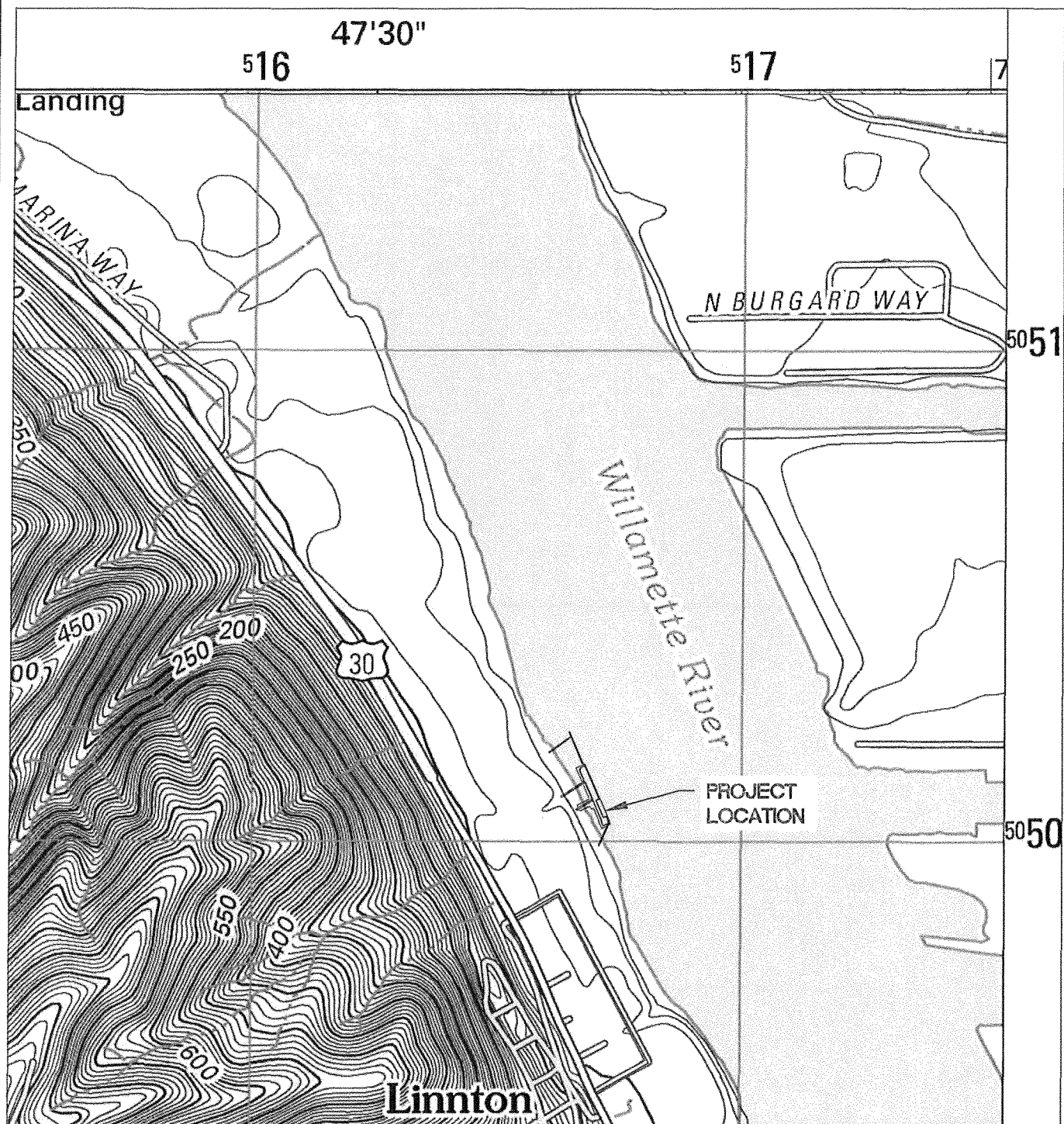


600' 300' 0' 600' 1200'  
1"=5000'

REFERENCE NUMBER:  
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PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 2 OF 14

	<b>NORWEST ENGINEERING</b>		N.E. #
	CONSULTING ENGINEERS 503-254-0110	4110 NE 122ND AVE #207 PORTLAND, OREGON	0409
KINDER MORGAN			
LINNTON OR			
LINNTON DOCK UPGRADE PORTLAND, OREGON VICINITY MAP			
CHKD. DLM	DRWN. TRF	PROJECT NO. 0409	
APPR. MJS	DATE 07/01/14	DWG. NO.	REV.
SCALE AS NOTED		P002	A

PRELIMINARY  
NOT FOR CONSTRUCTION



Produced by the United States Geological Survey  
 North American Datum of 1983 (NAD83)  
 World Geodetic System of 1984 (WGS84). Projection and  
 1 000-meter grid: Universal Transverse Mercator, Zone 10T  
 10 000-foot ticks: Oregon Coordinate System of 1983 (north  
 zone)

SCALE 1:24 000



**LINNTON QUADRANGLE**  
**OREGON**  
**7.5-MINUTE SERIES**

1"=1000' 1000' 500' 0' 1000' 2000'

REFERENCE NUMBER:  
 LOCATION: 11400 NW ST. HELENS RD.  
 PORTLAND, OR  
 PROPOSED PROJECT: DOCK UPGRADE  
 LATITUDE: 45.604298 N  
 LONGITUDE: 122.785911 W  
 WILLAMETTE RIVER MILE: 4.2  
 DATUM: COLUMBIA RIVER DATUM  
 DATE 07/01/2014 EXHIBIT 3 OF 14

PRELIMINARY  
 NOT FOR CONSTRUCTION



**NORWEST ENGINEERING**  
 CONSULTING ENGINEERS  
 503-254-0110 4110 NE 122ND AVE #207  
 PORTLAND, OREGON

N.E. #  
 0409

KINDER MORGAN  
 LINNTON OR

LINNTON DOCK UPGRADE  
 PORTLAND, OREGON  
 USGS TOPOGRAPHIC MAP

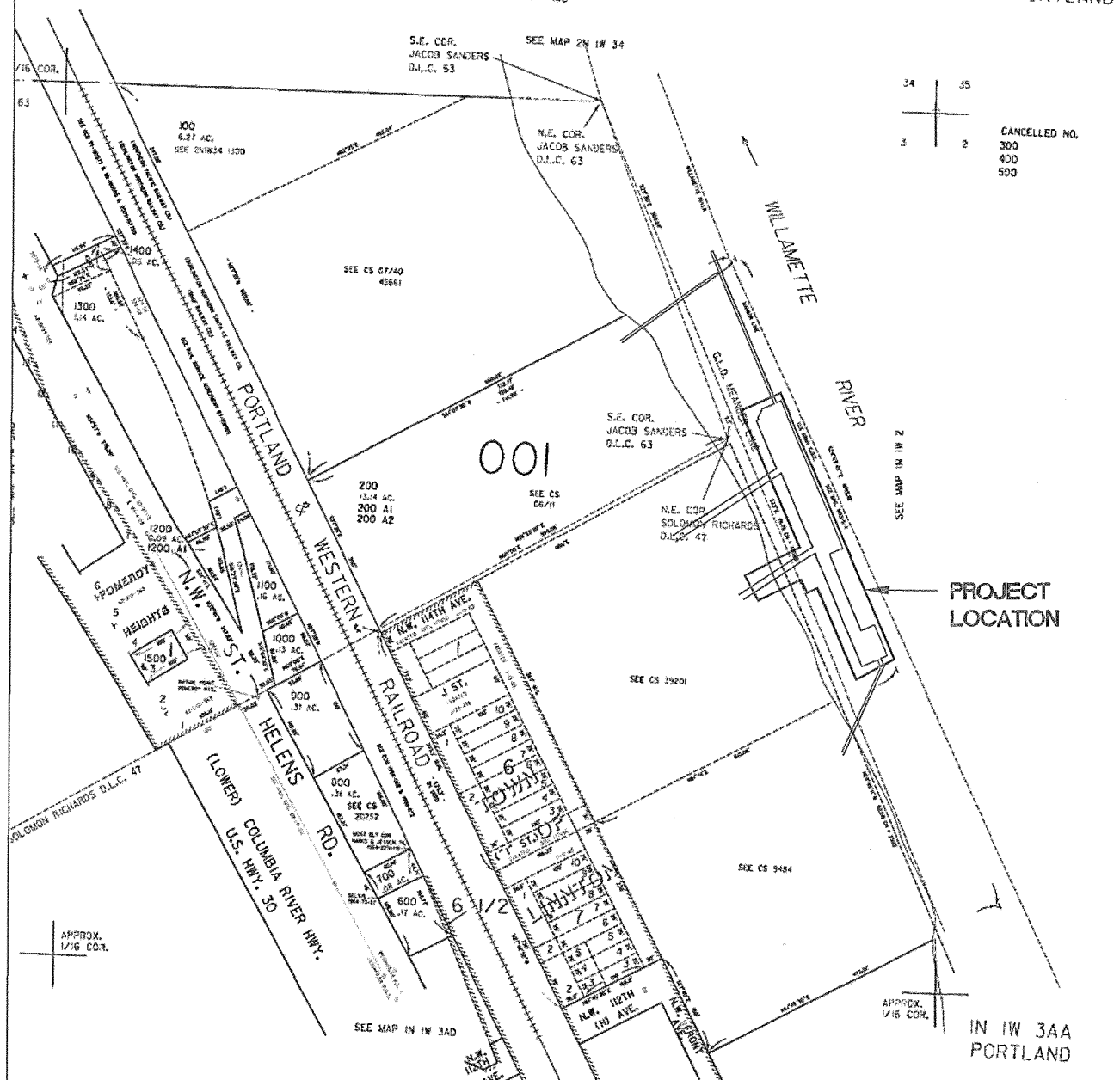
CHKD. DLM	DRWN. TRF	PROJECT NO. 0409
APPR. MJS	DATE 07/01/14	DWG. NO. P003
SCALE AS NOTED		REV. A



THIS MAP WAS PREPARED FOR  
ASSESSMENT PURPOSE ONLY

NE1/4 NE1/4 SEC. 3 T.1N. R.1W. W.M.  
MULTNOMAH COUNTY  
1" = 100'

IN IW 3AA  
PORTLAND



250' 125' 0' 250' 500'  
1"=250'

REFERENCE NUMBER:  
LOCATION: 11400 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 4 OF 14

PRELIMINARY  
NOT FOR CONSTRUCTION



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #  
0409

LINNTON

OR

LINNTON DOCK UPGRADE  
PORTLAND, OREGON  
TAX LOT MAP

CHKD. DLM

DRWN. TRF

PROJECT NO. 0409

APPR. MJS

DATE 07/01/14

DWG. NO.

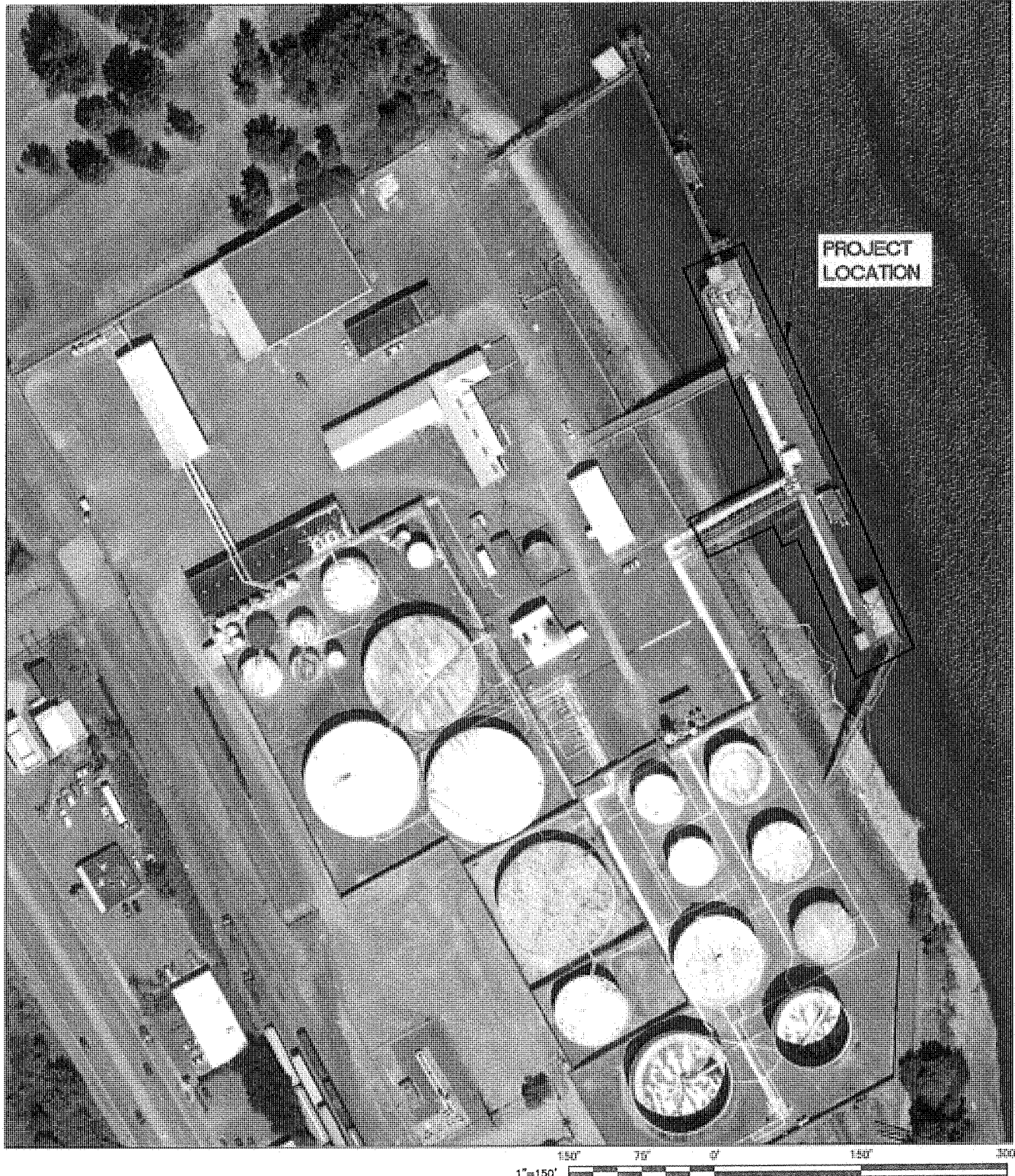
REV.

SCALE AS NOTED

P004

A





REFERENCE NUMBER:  
LOCATION: 11400 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 5 OF 14



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #  
0409

KINDER MORGAN

LINNTON

OR

LINNTON DOCK UPGRADE  
PORTLAND, OREGON  
AERIAL MAP

CHKD. DLM

DRWN. TRF

PROJECT NO. 0409

APPR. MJS

DATE 07/01/14

DWG. NO.

REV.

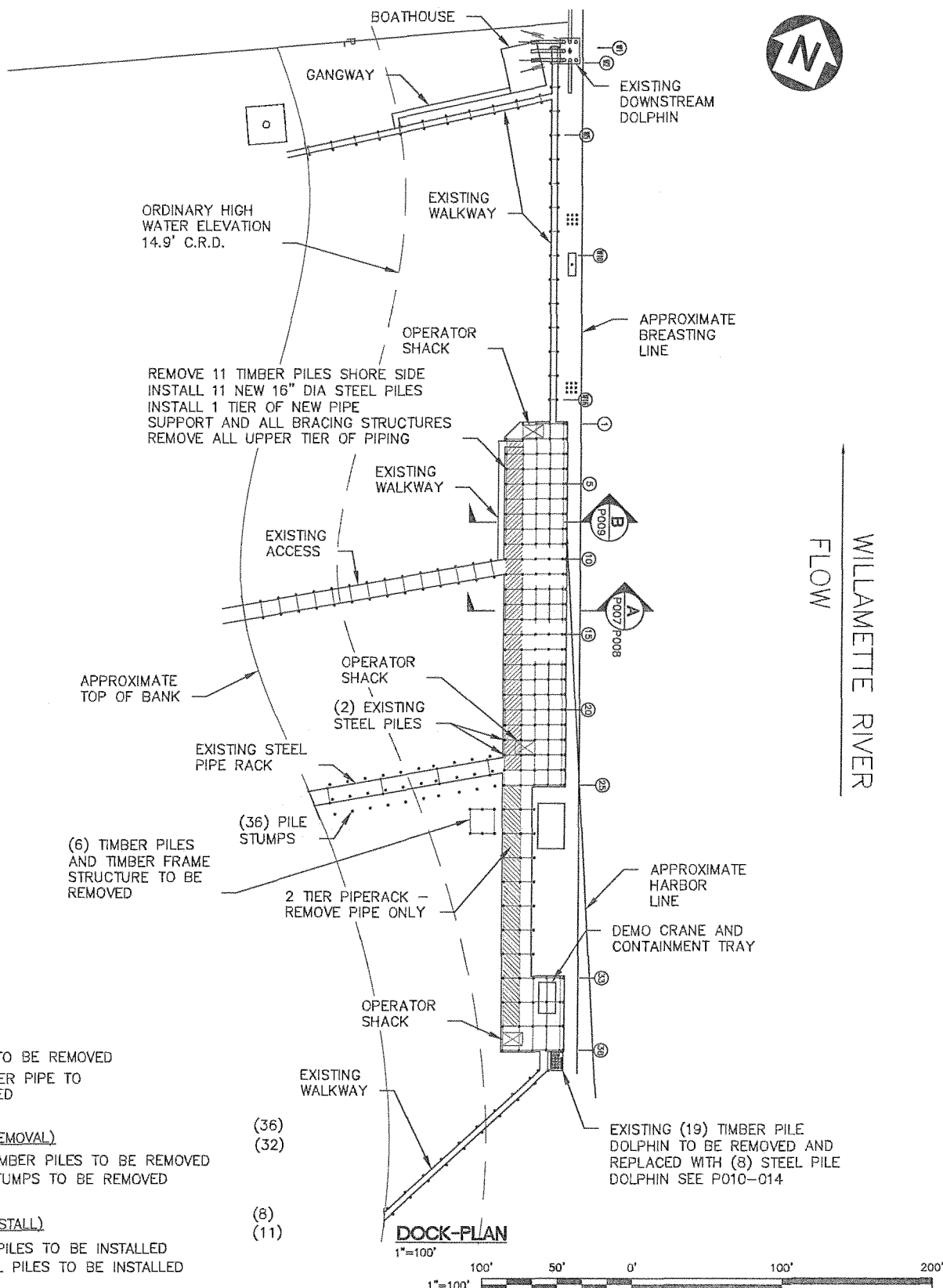
SCALE AS NOTED

P005

A

PRELIMINARY  
NOT FOR CONSTRUCTION





LEGEND:

- ALL PIPE TO BE REMOVED
- UPPPER TIER PIPE TO BE REMOVED

PILE TOTALS: (REMOVAL)

16" DIAMETER TIMBER PILES TO BE REMOVED  
TIMBER PILES STUMPS TO BE REMOVED

PILE TOTALS: (INSTALL)

24"x .5" STEEL PILES TO BE INSTALLED  
16"x .375" STEEL PILES TO BE INSTALLED

REFERENCE NUMBER:  
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PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 6 OF 14

PRELIMINARY  
NOT FOR CONSTRUCTION



NORWEST ENGINEERING

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #

0409

LINNTON

KINDER MORGAN

OR

LINNTON DOCK UPGRADE  
PORTLAND, OREGON  
DOCK PLAN

CHKD. DLM

DRWN. TRF

PROJECT NO. 0409

APPR. MJS

DATE 07/01/14

DWG. NO.

REV.

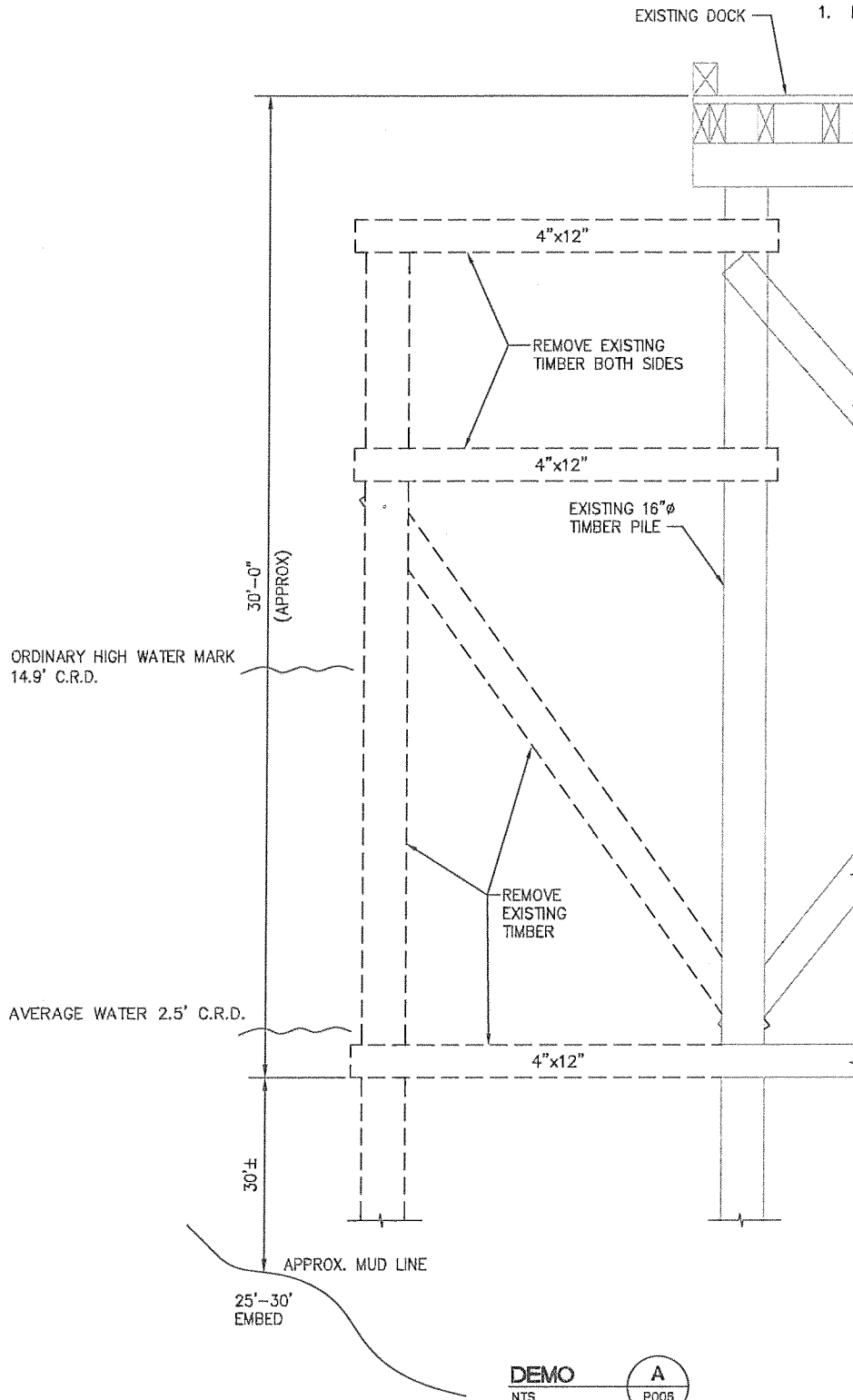
SCALE 1" = 100'

P006

A

GENERAL NOTES:

1. FOR GENERAL NOTES SEE DWG. P001



REFERENCE NUMBER:  
LOCATION: 11400 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 7 OF 14

PRELIMINARY  
NOT FOR CONSTRUCTION



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #

0409

LINNTON

KINDER MORGAN

OR

LINNTON DOCK UPGRADE  
PORTLAND, OREGON  
DOCK ELEVATION 1

CHKD. DLM

DRWN. TRF

PROJECT NO. 0409

APPR. MJS

DATE 07/01/14

DWG. NO.

REV.

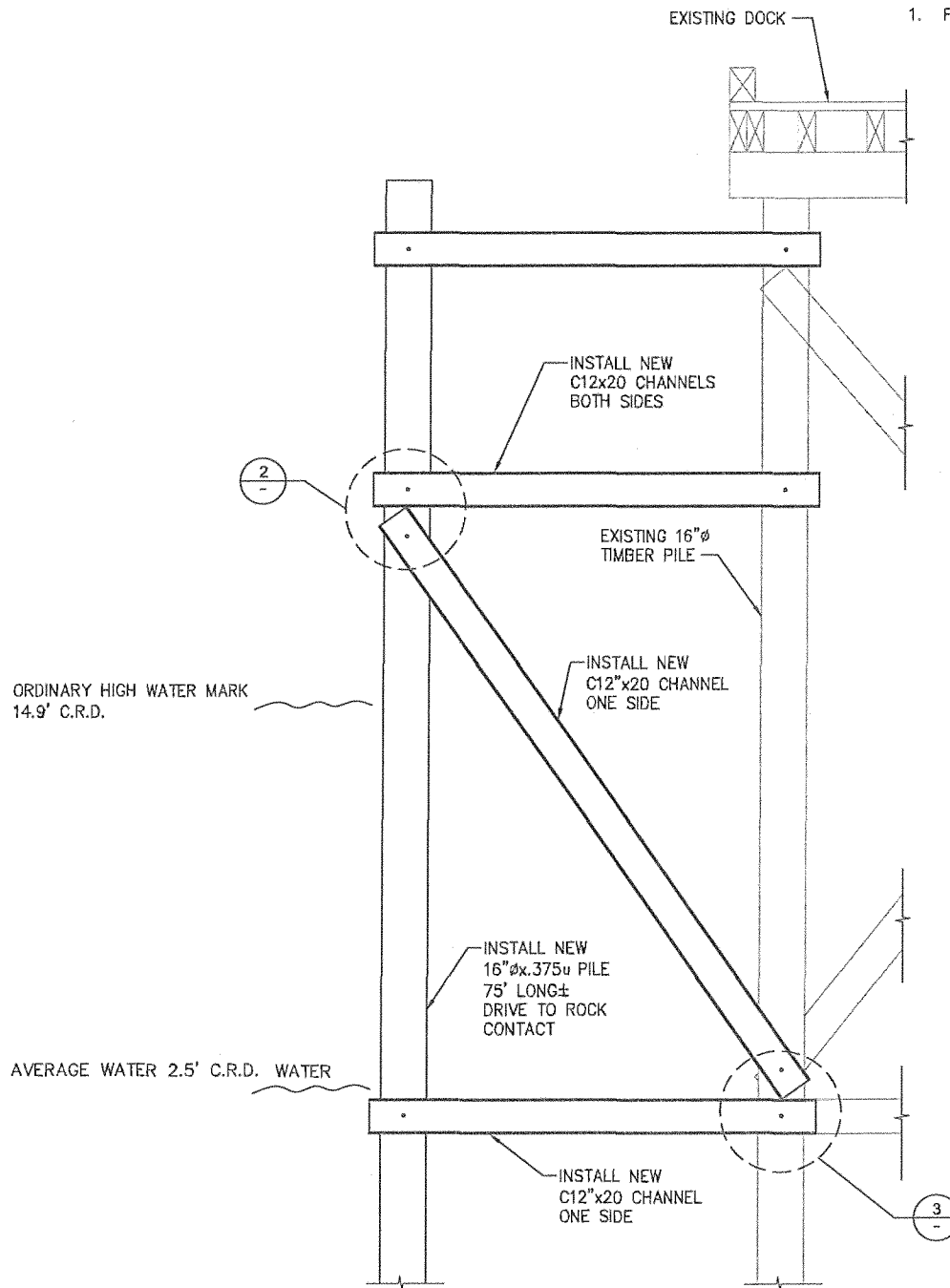
SCALE AS NOTED

P007

A

GENERAL NOTES:

1. FOR GENERAL NOTES SEE DWG. P001




SECTION  
NTS

A  
P006

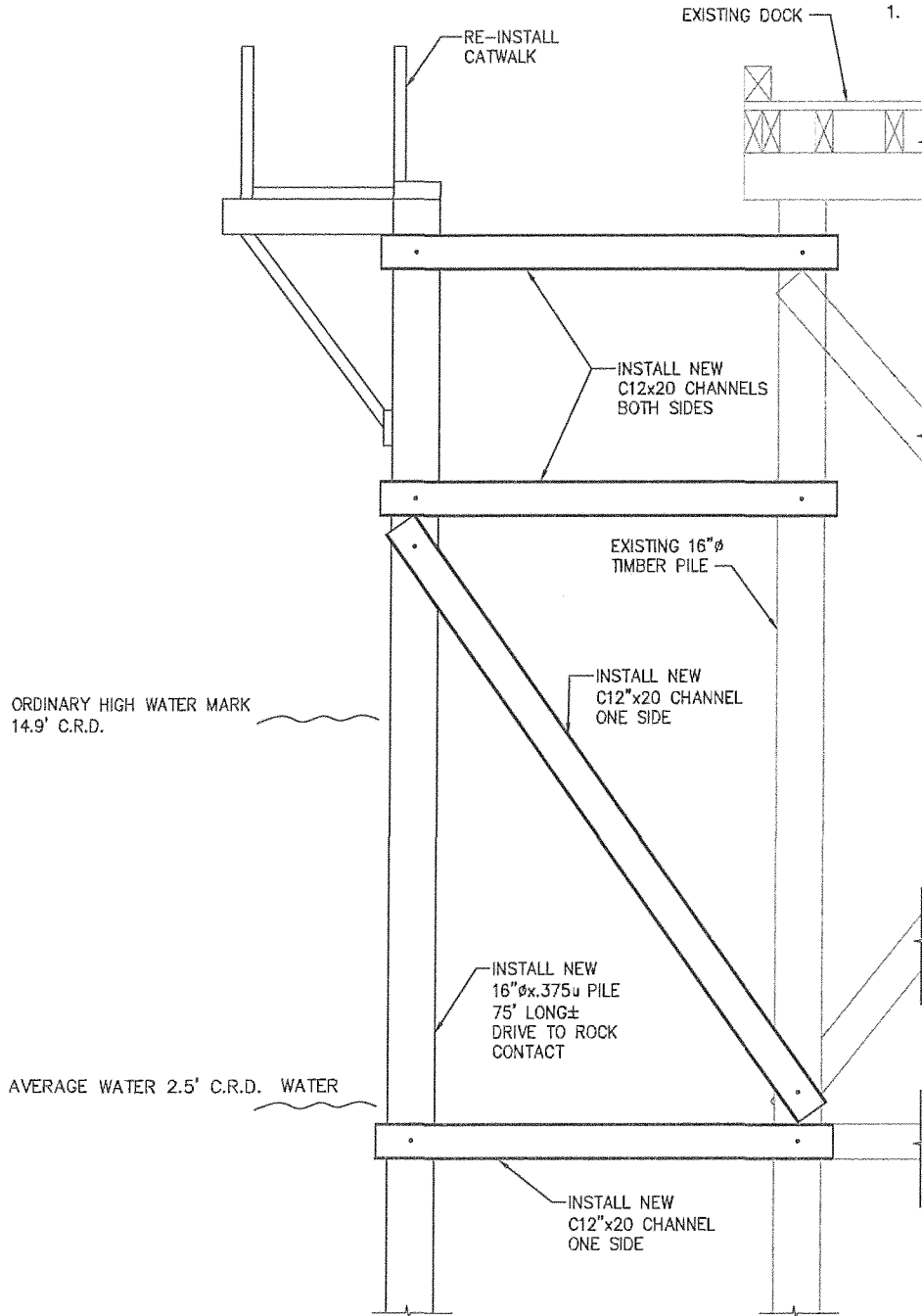
REFERENCE NUMBER:  
LOCATION: 11400 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 8 OF 14

PRELIMINARY  
NOT FOR CONSTRUCTION

	<b>NORWEST ENGINEERING</b>		N.E. #
	CONSULTING ENGINEERS 503-254-0110	4110 NE 122ND AVE #207 PORTLAND, OREGON	0409
KINDER MORGAN			
LINNTON		OR	
LINNTON DOCK UPGRADE PORTLAND, OREGON DOCK ELEVATION 2			
CHKD. DLM	DRWN. TRF	PROJECT NO.	0409
APPR. MJS	DATE 07/01/14	DWG. NO.	REV.
SCALE AS NOTED		P008	A

# GENERAL NOTES:

1. FOR GENERAL NOTES SEE DWG. P001



SECTION  
NTS

B  
P009

REFERENCE NUMBER:  
LOCATION: 11400 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 9 OF 14

PRELIMINARY  
NOT FOR CONSTRUCTION



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE #207  
PORTLAND, OREGON

N.E. #

0409

LINTON

KINDER MORGAN

OR

LINTON DOCK UPGRADE  
PORTLAND, OREGON  
DOCK ELEVATION 3

CHKD. DLM

DRWN. TRF

PROJECT NO. 0409

APPR. MJS

DATE 07/01/14

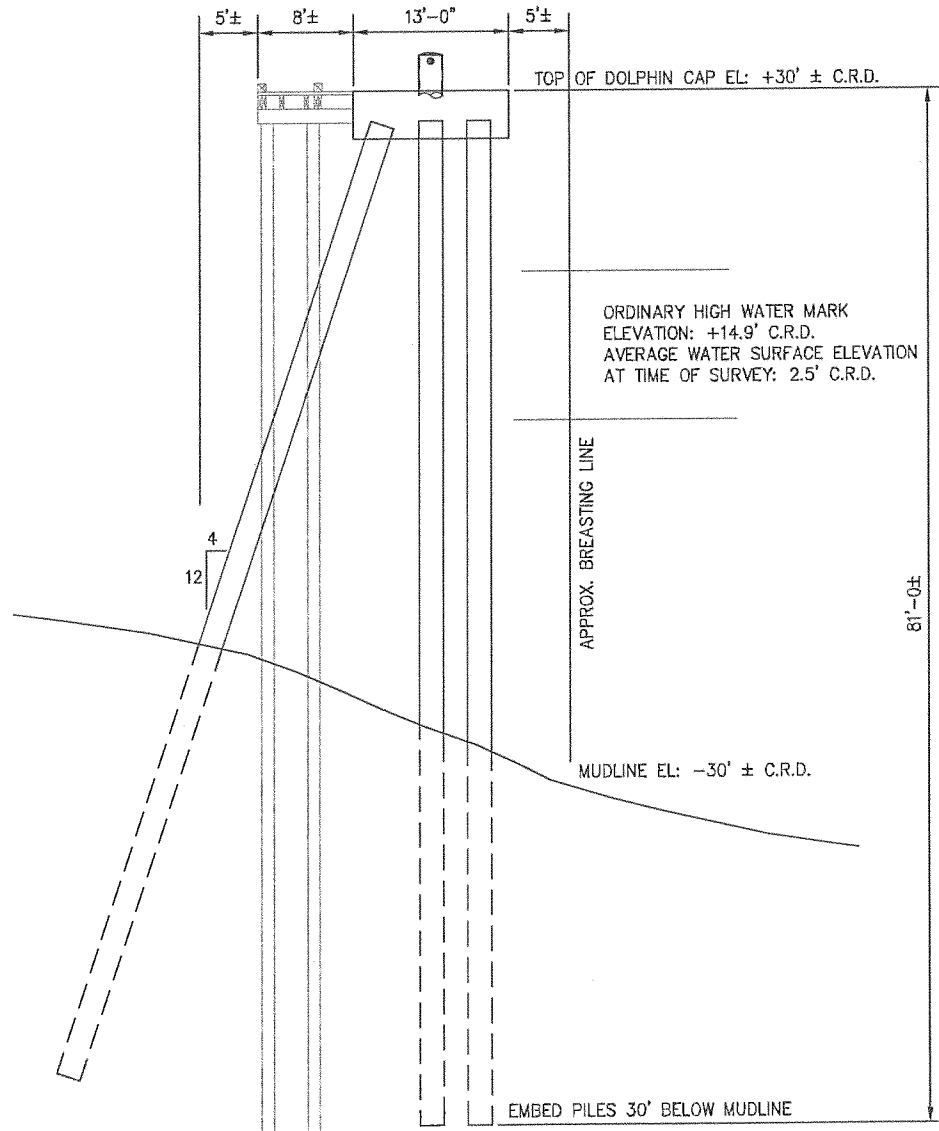
DWG. NO.

REV.

SCALE AS NOTED

P009

A



**MOORING DOLPHIN SOUTH ELEVATION**

NTS

REFERENCE NUMBER:  
 LOCATION: 11400 NW ST. HELENS RD.  
 PORTLAND, OR  
 PROPOSED PROJECT: DOCK UPGRADE  
 LATITUDE: 45.604298 N  
 LONGITUDE: 122.785911 W  
 WILLAMETTE RIVER MILE: 4.2  
 DATUM: COLUMBIA RIVER DATUM  
 DATE 07/01/2014 EXHIBIT 10 OF 14

PRELIMINARY  
 NOT FOR CONSTRUCTION



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
 503-254-0110

4110 NE 122ND AVE #207  
 PORTLAND, OREGON

N.E. #  
 0409

KINDER MORGAN  
 LINNTON OR

LINNTON DOCK UPGRADE  
 PORTLAND, OREGON  
 MOORING DOLPHIN SOUTH ELEVATION

CHKD. DLM

DRWN. TRF

PROJECT NO. 0409

APPR. MJS

DATE 07/01/14

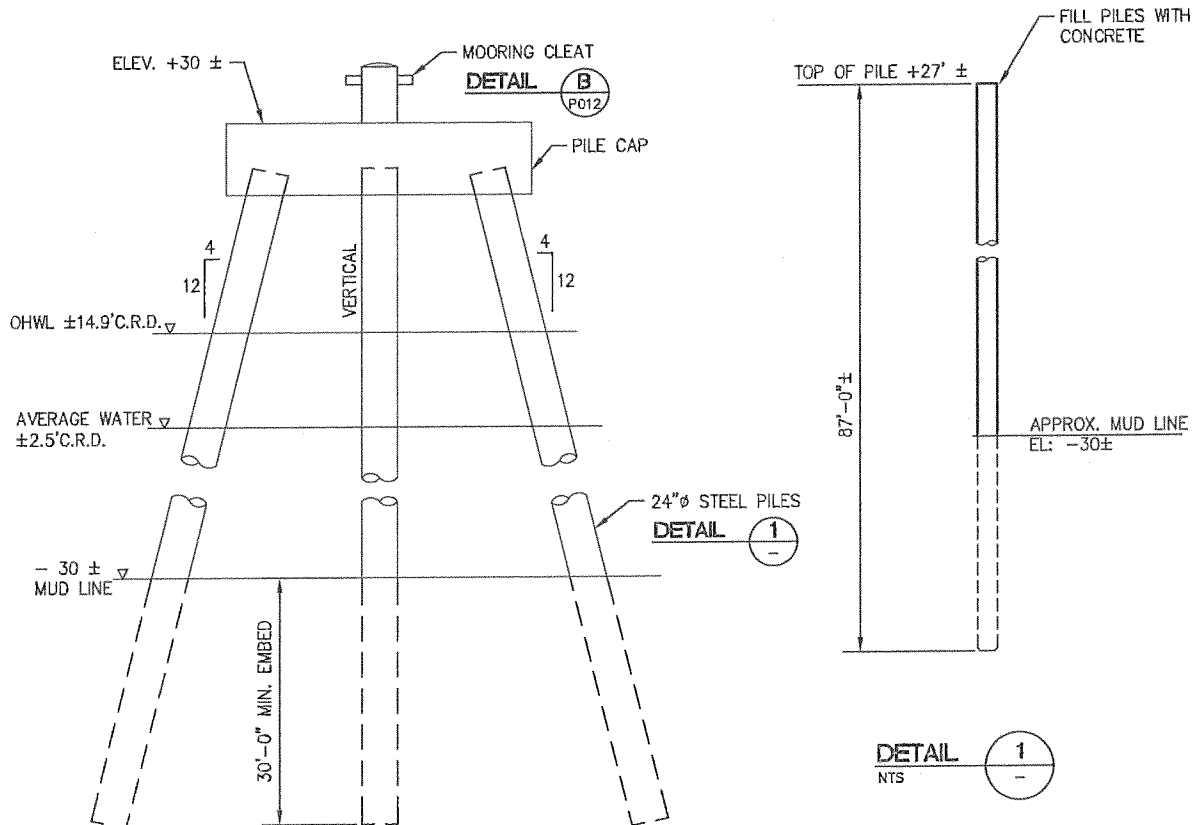
DWG. NO.

REV.

SCALE AS NOTED

P010

A

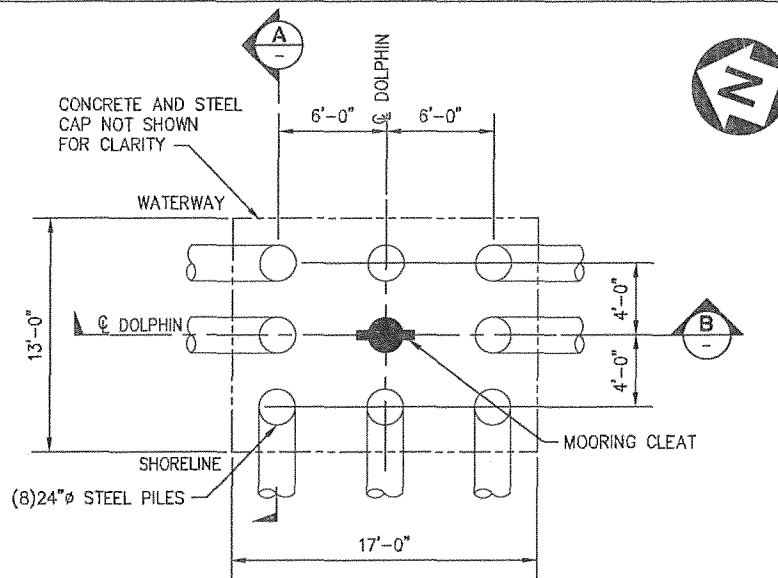


**FILE DOLPHIN WEST ELEVATION**  
NTS

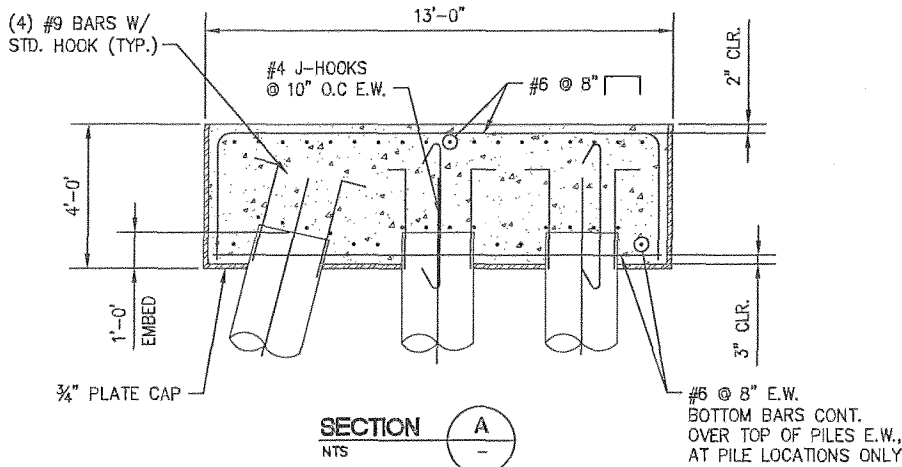
REFERENCE NUMBER:  
LOCATION: 11400 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 11 OF 14

PRELIMINARY  
NOT FOR CONSTRUCTION

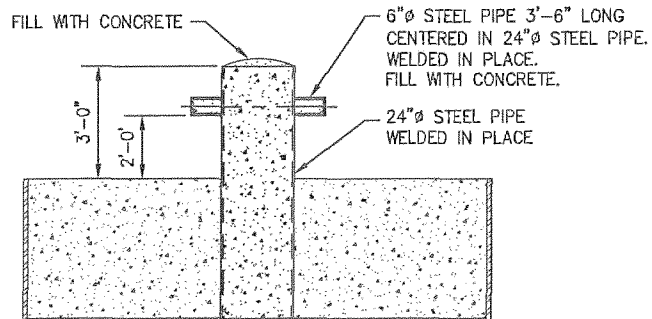
<b>NORWEST ENGINEERING</b> CONSULTING ENGINEERS 503-254-0110		4110 NE 122ND AVE #207 PORTLAND, OREGON		N.E. # 0409
		KINDER MORGAN OR		
LINNTON DOCK UPGRADE PORTLAND, OREGON MOORING DOLPHIN WEST ELEVATION				
CHKD. DLM	DRWN. TRF	PROJECT NO. 0409	REV. A	
APPR. MJS	DATE 07/01/14	DWG. NO. P011		
SCALE AS NOTED				



**PILE DOLPHIN PLAN**  
NTS



**SECTION A**  
NTS



NOTE: PILES NOT SHOWN FOR CLARITY

**SECTION B**  
NTS

REFERENCE NUMBER:  
LOCATION: 11400 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 12 OF 14

PRELIMINARY  
NOT FOR CONSTRUCTION



**NORWEST ENGINEERING**

CONSULTING ENGINEERS  
503-254-0110

4110 NE 122ND AVE. #207  
PORTLAND, OREGON

N.E. #  
0409

LINNTON OR

LINNTON DOCK UPGRADE  
PORTLAND, OREGON  
MOORING DOLPHIN PLAN & SECTION

CHKD. DLM

DRWN. TRF

PROJECT NO. 0409

APPR. MJS

DATE 07/01/14

DWG. NO.

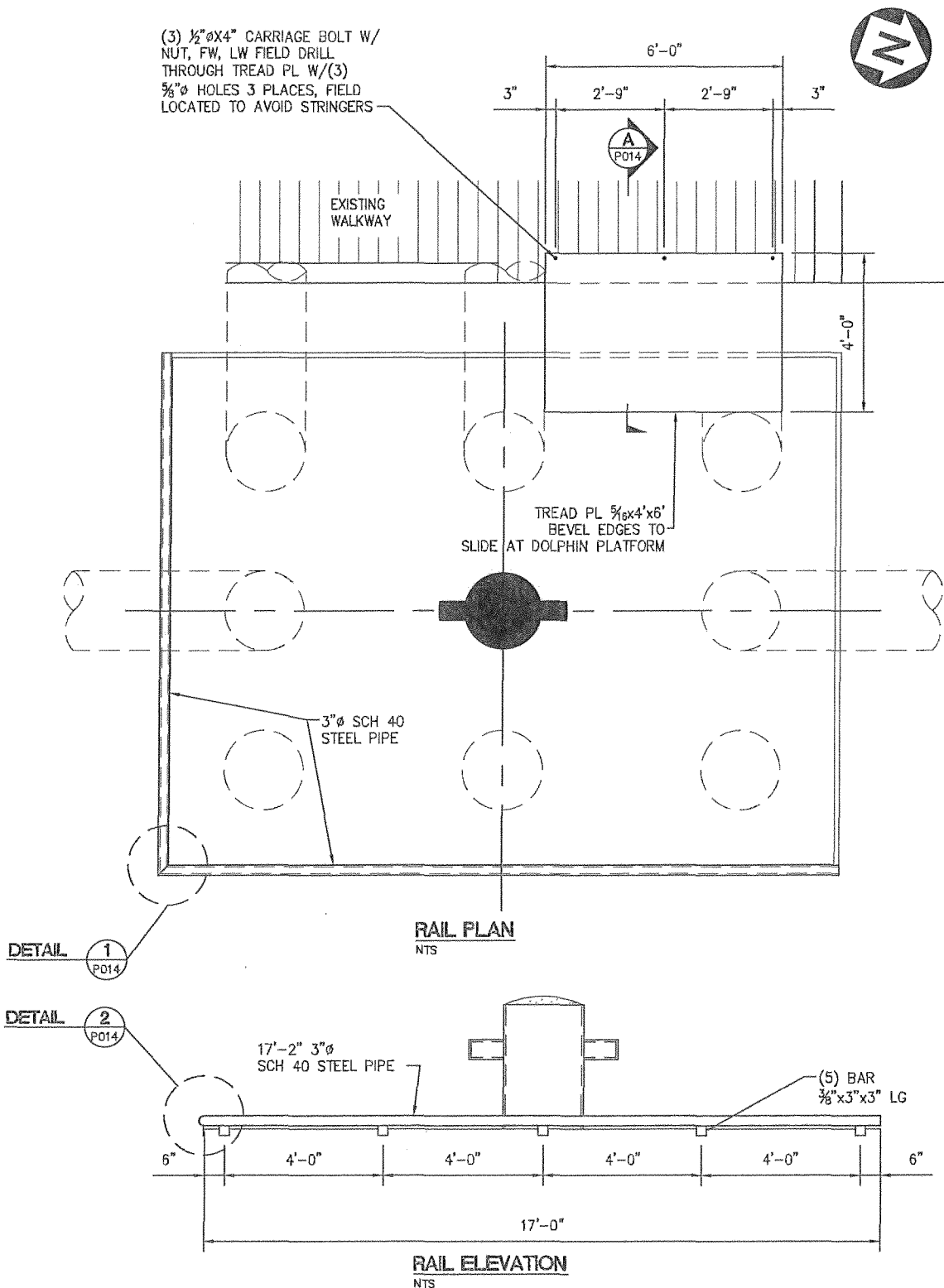
REV.

SCALE AS NOTED

P012


A



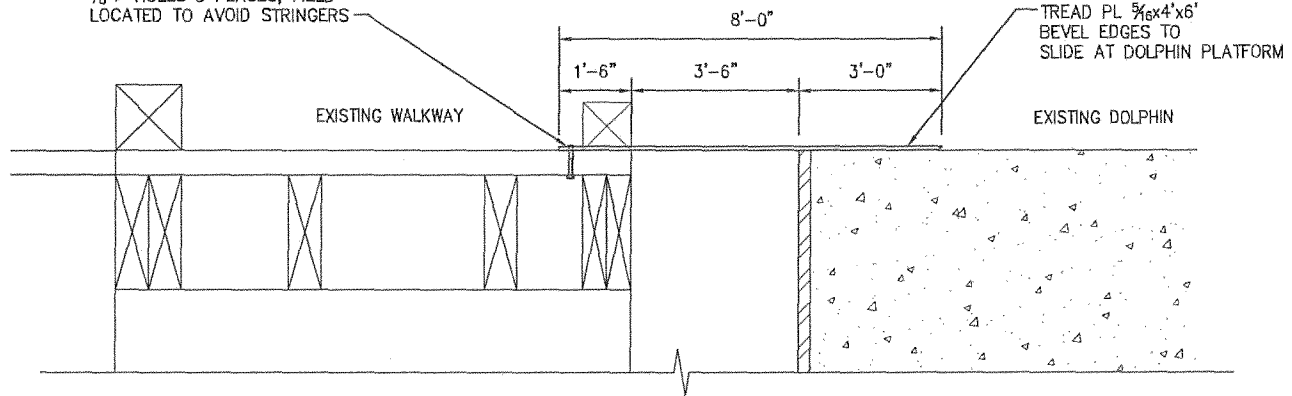


REFERENCE NUMBER:  
LOCATION: 11400 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 13 OF 14

PRELIMINARY  
NOT FOR CONSTRUCTION

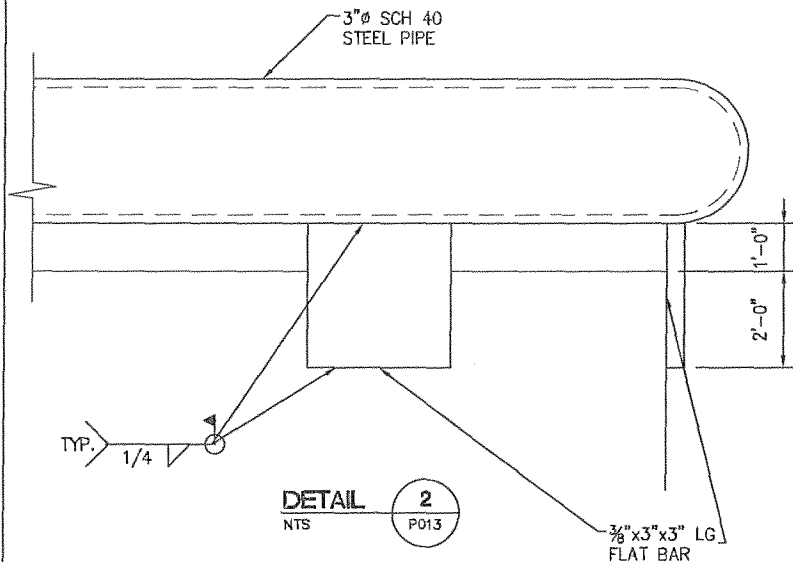
 <b>NORWEST ENGINEERING</b> CONSULTING ENGINEERS 503-254-0110		4110 NE 122ND AVE #207 PORTLAND, OREGON		N.E. # 0409
		<b>KINDER MORGAN</b> LINNTON OR		
LINNTON DOCK UPGRADE PORTLAND, OREGON MOORING DOLPHIN RUB RAIL & ELEVATION				
CHKD. DLM	DRWN. TRF	PROJECT NO. 0409		REV. A
APPR. MJS	DATE 07/01/14	DWG. NO. P013		
SCALE AS NOTED				

(3) 1/2"ØX4" CARRIAGE BOLT W/  
NUT, FW, LW FIELD DRILL  
THROUGH TREAD PL W/(3)  
5/8"Ø HOLES 3 PLACES, FIELD  
LOCATED TO AVOID STRINGERS



SECTION  
NTS

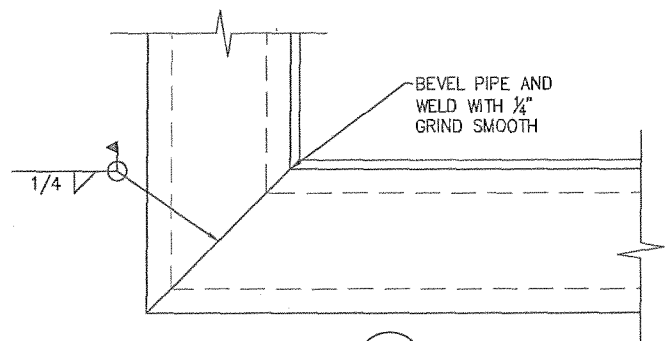
A  
P013



DETAIL  
NTS

2  
P013

3/8"X3"X3" LG.  
FLAT BAR




DETAIL  
NTS

1  
P013

REFERENCE NUMBER:  
LOCATION: 11400 NW ST. HELENS RD.  
PORTLAND, OR  
PROPOSED PROJECT: DOCK UPGRADE  
LATITUDE: 45.604298 N  
LONGITUDE: 122.785911 W  
WILLAMETTE RIVER MILE: 4.2  
DATUM: COLUMBIA RIVER DATUM  
DATE 07/01/2014 EXHIBIT 14 OF 14

PRELIMINARY  
NOT FOR CONSTRUCTION

 <b>NORWEST ENGINEERING</b> CONSULTING ENGINEERS 503-254-0110		N.E. # 0409
KINDER MORGAN LINNTON OR		
LINNTON DOCK UPGRADE PORTLAND, OREGON MOORING DOLPHIN RUB RAIL SECTIONS		
CHKD. DLM APPR. MJS SCALE AS NOTED	DRWN. TRF DATE 07/01/14	PROJECT NO. 0409 DWG. NO. P014 REV. A